

2017



Missouri Deer Season Summary & Population Status Report



Missouri Department of Conservation

Prepared by:

Cervid Program Staff

Resource Science Division

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Cervid Program Mission and Vision

The mission of the Missouri Department of Conservation's Cervid (Deer & Elk) Program is to use science-based wildlife management to maintain biologically and socially balanced deer and elk populations that provide sustainable recreation, and that minimize human-cervid conflicts and the potential for negative impacts on ecosystem health. To put this mission into action, the Cervid Program is guided by four specific management goals:

Goal 1: Cervid Population Management – Proactively manage deer and elk populations for a balanced sex and age structure while maintaining densities at or below the biological and social carrying capacity within the defined management units using science-based wildlife management practices.

Goal 2: Hunting and Recreation – Provide opportunities for all citizens to enjoy deer- and elk-related recreational activities and promote hunting as a socially and culturally important tradition which is the primary tool for achieving deer and elk population goals.

Goal 3: Health and Disease Management – Ensure the maintenance of a healthy deer and elk populations and minimize the threat and impacts of disease on cervid populations in Missouri.

Goal 4: Education, Communication, and Public Engagement – Provide abundant and adequate information to the public about all aspects of deer and elk management in Missouri, and create opportunities for additional public engagement in decisions about the management of Missouri's cervid resources.

The Cervid Program, managed by the Resource Science Division, develops annual regulation recommendations based on harvest data, hunter and landowner surveys, MDC staff surveys, public comments, population simulations, and the Chronic Wasting Disease (CWD) management plan. The protection and management of all of Missouri's valuable wildlife is made possible thanks to MDC staff, private landowners, and all other Missourians supporting the one-eighth of one percent Conservation Sales Tax, permit sales, and income generated by fish and wildlife tourism.



Thank you!

Equal Opportunity to Participate

Equal opportunity to participate in and benefit from programs of the Missouri Department of Conservation is available to all individuals without regard to their race, color, nationality, sex, age, or disability. Questions should be directed to the Department of Conservation, PO Box 180, Jefferson City, MO 65102, 573-751-4115 (voice) or 800-735-2966 (TTY), or to the U.S. Fish and Wildlife Service Division of Federal Assistance, 4401 N. Fairfax Drive, Mail Stop: MBSP-4020, Arlington, VA 22203.

2017 Overview

Season	Dates	What Was New for 2017?	
Archery Deer and Turkey	Sept. 15-Nov. 10, 2017 Nov. 22, 2017-Jan. 15, 2018	<ul style="list-style-type: none"> Hunters could take only two antlered deer during the archery and firearms deer seasons combined. This rule did not change from 2016. However, youth hunters may now take their second antlered buck during the early youth portion of firearms season. Previously, youth hunters had to wait until the November portion to take their second antlered buck. Hunters who harvested deer during opening weekend within 25 selected counties in the Chronic Wasting Disease (CWD) Management Zone were required to take it to a sampling station to be tested for CWD. 	<ul style="list-style-type: none"> Hunters could fill two firearms antlerless permits in Barry, Benton, Cedar, Dade, Hickory, Ozark, Polk, St. Clair, St. Francois, Ste. Genevieve, Stone, and Taney counties. Qualifying landowners in Barry, Dade, Ozark, Polk, St. Francois, Ste. Genevieve, Stone and Taney counties could receive two no-cost firearms antlerless permits. Barry, Dade, Ozark, Polk, St. Francois, Ste. Genevieve, Stone, and Taney counties were open during the antlerless portion of firearms season.
Firearms Deer Early Youth Portion	Oct. 28-29, 2017		
Firearms Deer November Portion	Nov. 11-21, 2017		
Firearms Deer Late Youth Portion	Nov. 24-26, 2017		
Firearms Deer Antlerless Portion	Dec.1-3, 2017	<ul style="list-style-type: none"> New counties were added to the CWD Management Zone. Hunters could use firearms antlerless permits in Bollinger County. 	<ul style="list-style-type: none"> The antler-point restriction was lifted in Benton, Cedar, Hickory, and St. Clair counties.
Firearms Deer Portion	Dec. 23, 2017-Jan. 2, 2018		

Season Summary

Overall, 2017 was a great year for Missouri deer hunters! Total deer harvest was 7% higher than in 2016 (**Table 1**) and was characterized by another record harvest of antlered bucks (**Figure 1**). Harvest increased across most of the season portions from 2016 (**Table 2**). Overall, the total deer harvest was the 9th ranked harvest we've ever recorded in Missouri. The favorable harvest is a product of deer populations nearing recovery from the 2012 hemorrhagic disease outbreak throughout much of the state, favorable season timing and weather conditions, and liberalized harvest regulations within the Chronic Wasting Disease (CWD) Management Zone. We are likely to see these harvest trends continue for 2018.

Statewide Deer Management

Deer populations across much of Missouri are currently at, or slightly below, desired levels (**Figure 5**). Therefore, statewide deer management goals are largely focused on stabilizing or slightly increasing deer numbers, while balancing these efforts with ongoing Chronic Wasting Disease (CWD) management. To achieve these goals, firearms antlerless permits have been limited and the Antlerless Portion of firearms season has been reduced to 3 days. Within the CWD Management Zone, firearms antlerless permits have been liberalized and the APR lifted to prevent unwanted population increases where the disease is likely to exist and limit the number of young bucks that may disperse and carry the disease to new areas.

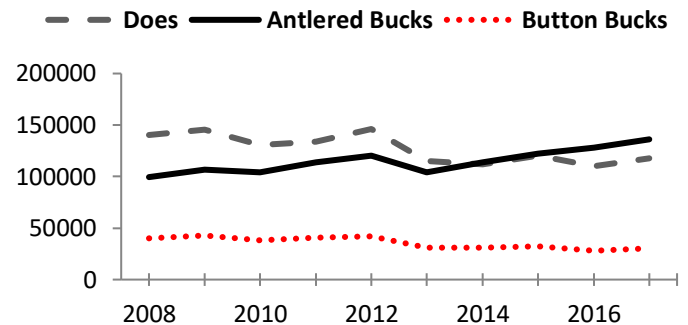


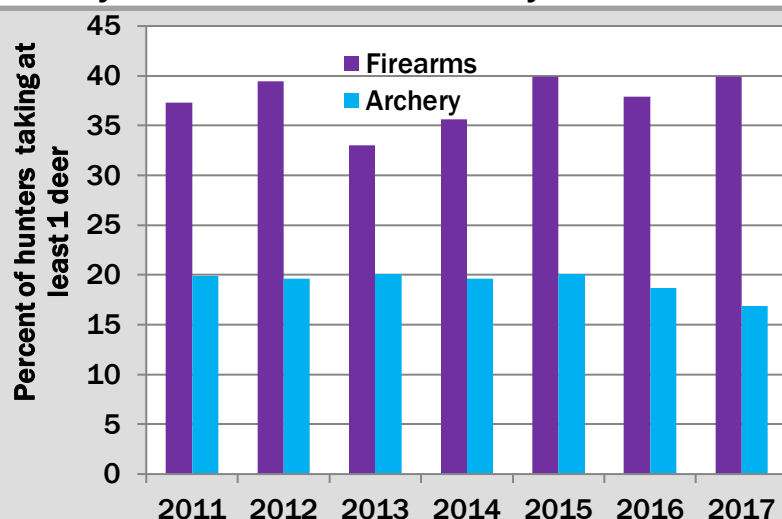
Figure 1. The number of does, antlered bucks, and button bucks harvested statewide from 2008 to 2017.

Table 1. The total 2017 harvest by region compared to 2016, the 5-year average, and the 10-year average.

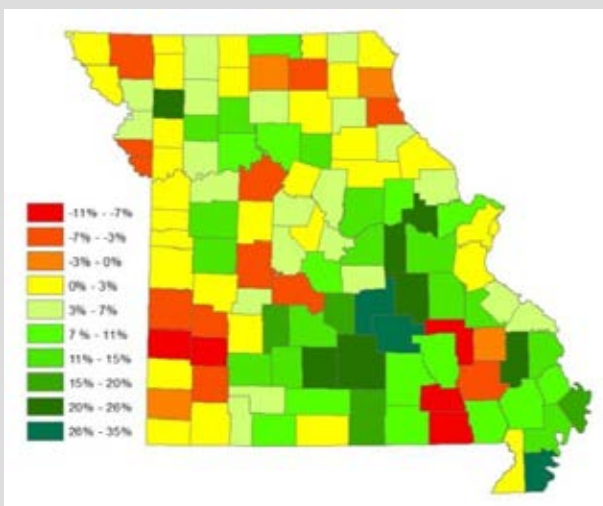
2017 Harvest Overview				
Region	Total Harvest	Difference from 2016	Difference from 5-yr Avg.	Difference from 10-yr Avg.
Central	43,600	8%	8%	1%
Kansas City	26,341	2%	4%	-5%
Northeast	39,237	3%	3%	-9%
Northwest	28,909	5%	0%	-17%
Ozark	45,270	14%	13%	18%
Southeast	32,599	6%	4%	14%
Southwest	41,356	5%	6%	9%
St. Louis	27,165	11%	10%	11%
Statewide	284,477	7%	7%	2%

2017 Deer Season Summaries

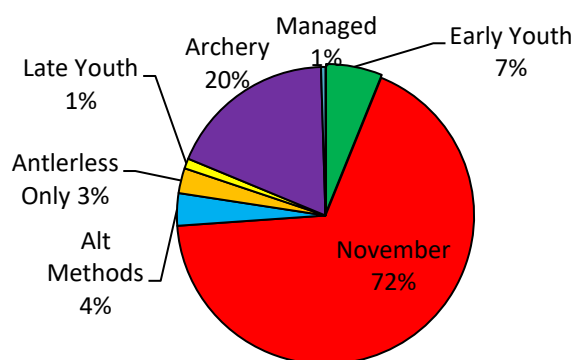
Archery and Firearms Season: By the Numbers



Success rates of firearms and archery deer hunters from 2011-2017. Firearms hunter success rates increased slightly in 2017 while archery hunter success rates decreased – likely a consequence of increases in landowner archery permits distributed in 2017 (See Figure 2 below).



Percent change in total deer harvest in each county from the 2016 deer season to the 2017 deer season.



Composition of total deer harvest in Missouri by season and portion of the firearms season, 2017.

Deer harvested during just 2 days - the opening weekend of the November Portion- constitute about 50% of the total harvest during that 11-day portion and 33% of the annual deer harvest!

Antlered bucks – 53,978

Does – 31,380

Button bucks – 9,528

2017 opening weekend total – 94,866

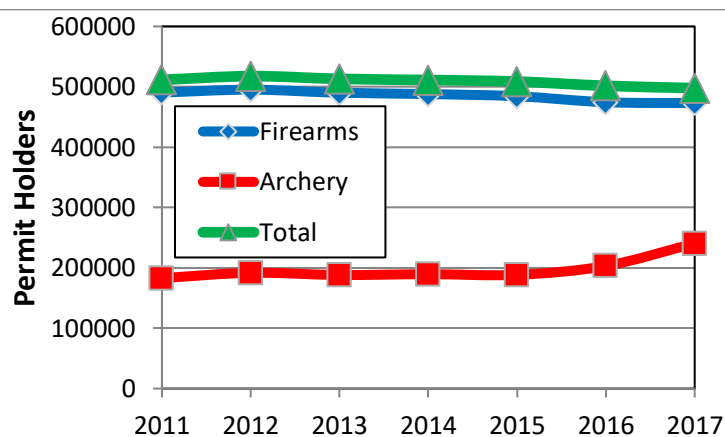


Figure 2. Trend in deer permit holders, 2011-2017.

Hunter numbers have been declining throughout the nation as the “baby boomer” generation ages out of the sport faster than they are being replaced by new hunters. Here in Missouri, we’ve kept hunter numbers relatively stable through recruitment and retention efforts and have not yet seen sharp declines as in other states (Figure 2). However, hunter recruitment and retention is an important priority for MDC. We have seen increases in archery hunter participation likely as a result of the regulation change allowing crossbows as a legal method. However, another change in 2017 with the way landowner permits were distributed resulted in a large number of landowners receiving archery deer permits that actually had no intention of participating in the archery season (see Table 3). Thus, we don’t believe the increase in archery hunter participation in 2017 actually reflects significantly higher archer numbers compared to the increase in 2016.

Season/ Portion	Antlered Bucks			Button Bucks			Does			Total		
	2016	2017	Change	2016	2017	Change	2016	2017	Change	2016	2017	Change
Archery	20,771	21,283	2%	4,694	5,347	14%	22,086	25,361	15%	47,551	51,991	9%
Managed Hunts	385	395	3%	222	218	-2%	786	749	-5%	1,393	1,362	-2%
Early Youth	7,258	10,124	39%	1,007	1,617	61%	2,914	5,671	95%	11,179	17,412	56%
Late Youth	1,168	1,299	11%	433	453	5%	1,389	1,363	-2%	2,990	3,115	4%
November	95,717	100,161	5%	18,977	20,267	7%	71,187	72,369	2%	185,881	192,797	4%
Alternative Methods	2,792	2,830	1%	1,497	1,311	-12%	6,236	5,886	-7%	10,615	10,027	-6%
Antlerless Only	28	35	25%	1,131	1,389	23%	5,376	6,349	18%	6,535	7,773	19%
CWD ¹	54	96	78%	11	12	9%	35	35	0%	100	143	43%
Total²	128,173	136,223	6%	27,972	30,164	9%	110,099	117,783	7%	266,244	284,620	7%

Table 2. Deer Season Harvest Comparison: 2016 & 2017

¹CWD Management Seals are part of the MDC's management plan to limit the spread of CWD. These seals were distributed to landowners who own 5 acres or more in the CWD Core Areas (see page 32), which permit the harvest of one deer of either sex on the specific property for which it was issued.

²These totals contain the CWD Seals and will not reflect the same numbers as Tables 1 or 5.

Table 3. Permits Issued and Harvest by Permit Type

Permit Type	Number of Permits			Number of Deer Harvested ¹		
	2016	2017	Change	2016	2017	Change
Permittee Archery Any-Deer	115,475	116,098	1%	24,018	24,986	4%
Landowner Archery Any-Deer	94,339	130,786	39%	6,188	6,251	1%
Youth Archery Any-Deer	7,455	7,563	1%	1,049	1,157	10%
Permittee Archery Antlerless	51,784	54,275	5%	11,533	13,247	15%
Landowner Archery Antlerless	165,114	251,087	52%	5,287	6,654	26%
Youth Archery Antlerless	2,700	2,777	3%	303	438	45%
Permittee Firearms Any-Deer	289,281	284,575	-2%	80,628	83,300	3%
Landowner Firearms Any-Deer	178,004	180,285	1%	38,587	40,896	6%
Youth Firearms Any-Deer	54,079	53,215	-2%	17,474	20,570	18%
Permittee Firearms Antlerless	179,747	185,428	3%	51,821	55,049	6%
Landowner Firearms Antlerless	154,579	159,899	3%	21,857	22,824	4%
Youth Firearms Antlerless	21,520	24,195	12%	5,734	7,231	26%
Resident Firearms	846,324	854,590	1%	203,643	216,135	6%
Nonresident Firearms	30,886	33,007	7%	12,458	13,735	10%
Resident Archery	423,738	548,347	29%	44,306	47,980	8%
Nonresident Archery	13,129	14,236	8%	4,072	4,753	17%

¹The total of deer harvested in this table does not include deer telechecked under unknown permits and will not reflect the same numbers as Table 5.

Table 4. Deer Hunter and Harvest Facts

	Archery	Firearms	Archery & Firearms Combined
Age Distribution of Hunters	Number of Hunters		Total Hunters ¹
<i>10 or younger</i>	4,776	23,031	23,321
<i>11-15</i>	14,117	44,955	45,827
<i>16-40</i>	97,558	176,319	189,866
<i>41 or older</i>	124,078	232,041	241,672
<i>Total hunters</i>	240,529	476,346	500,686
Any-Deer Permits Issued	Number of Permits		Number of Hunters ¹
<i>Resident</i>	112,381	315,658	335,149
<i>Nonresident</i>	11,280	22,132	30,229
<i>Landowner</i>	130,783	180,285	180,697
Antlerless Permit Sales ²	Number of Hunters		Total Hunters
<i>1</i>	43,384	177,721	205,208
<i>2</i>	5,443	14,548	25,475
<i>3</i>	536	600	1,872
<i>4 or more</i>	259	221	1,083
Deer Harvested	Number of Hunters		Number of Hunters ³
<i>0</i>	199,854	287,666	290,546
<i>1</i>	31,934	152,467	156,276
<i>2</i>	6,701	31,451	40,874
<i>3</i>	1,358	4,262	9,287
<i>4 or more</i>	682	500	3,703
Antlered Bucks Harvested	Number of Hunters		Number of Hunters ³
<i>0</i>	219,376	363,035	372,351
<i>1</i>	20,612	112,617	121,231
<i>2</i>	541	694*	7,104
Deer Harvested	Percent of Hunters		Percent of Hunters ³
<i>0</i>	83%	60%	58%
<i>1</i>	13%	32%	31%
<i>2</i>	3%	7%	8%
<i>3 or more</i>	0.8%	1.0%	2.6%
Antlered Bucks Harvested	Percent of Hunters		Percent of Hunters ³
<i>0</i>	91%	76%	74%
<i>1</i>	9%	24%	24%
<i>2</i>	0.2%	0.1%*	1.4%

¹ Number of individuals that held an archery and/or firearms any-deer permit² Excludes no-cost landowner permits³ Number/Percent of individuals that harvested the specified number when combining their archery and

*Includes hunters harvesting antlered bucks on CWD Management Seals and managed hunts

Regional Deer Populations

Statewide deer population trends are important; however, regional deer population trends are more informative to most landowners and hunters. This smaller scale makes deer population trends apparent and the factors influencing populations more easily identified. Although regional information is more indicative of population trends, it is important to acknowledge that deer populations can vary considerably within a region, and even within a county. Regional and local diversity in deer numbers is a result of differences in land cover and use, harvest regulations, hunter goals and density, and disease events, to name a few. Therefore, regional information should be considered as a starting point when evaluating deer populations within a localized area.



Regional Offices

Central Region

3500 East Gans Road
Columbia, MO 65201
573-815-7900

Kansas City Region

12405 SE Ranson Road
Lee's Summit, MO 64082
816-622-0900

Northwest Region

701 James McCarthy Dr.
St. Joseph, MO 64507
816-271-3100

Ozark Region

551 Joe Jones Blvd.
West Plains, MO 65775
417-256-7161

Southeast Region

2302 County Park Drive
Cape Girardeau, MO 63701
573-290-5730

Northeast Region

3500 S. Baltimore
Kirksville, MO 63501
660-785-2420

Southwest Region

2630 N. Mayfair
Springfield, MO 65803
417-895-6880

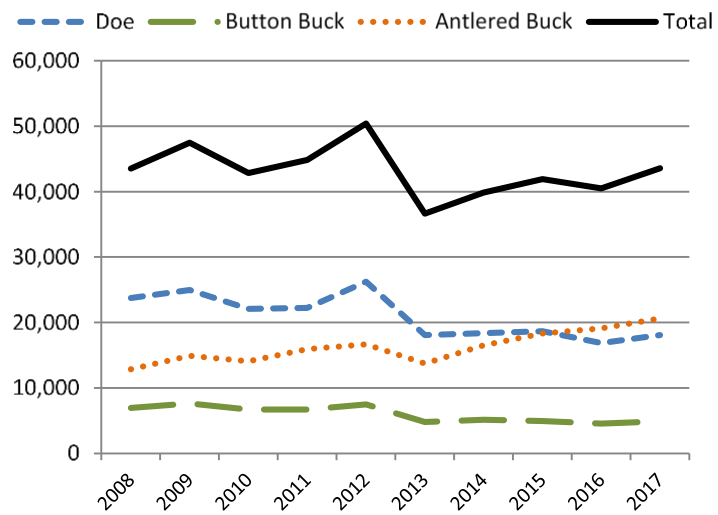
St. Louis Region

2360 Highway D
St. Charles, MO 63304
636-441-4554

Central Region Deer Summary

In 2017, the Central Region had the 3rd highest regional deer harvest with a total of 43,600 deer (**Table 1**) which was 8% higher than 2016. The deer population in the Central Region continues to slowly recover from a low point in 2013 following a particularly extreme outbreak of hemorrhagic disease in 2012. Overall, the population is well below the biological carrying capacity for the Central Region, and according to recent survey results, deer populations remain at, or slightly below, the socially acceptable level (**Figure 5**). Most of the Central Region is within a CWD Management Zone due to the CWD positive deer detected in Cole County in 2014.

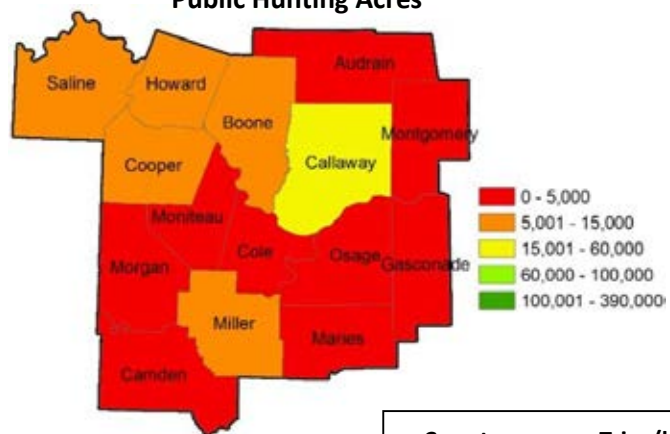
Central Region Harvest



CWD Status by County



Public Hunting Acres



2017 Top 5 Harvest Counties

Callaway – 5,020
 Osage – 4,286
 Gasconade – 3,965
 Morgan – 3,932
 Camden – 3,589

2017 Lowest and Highest Deer Harvest per Square Mile

Saline – 2.48
 Gasconade – 7.98

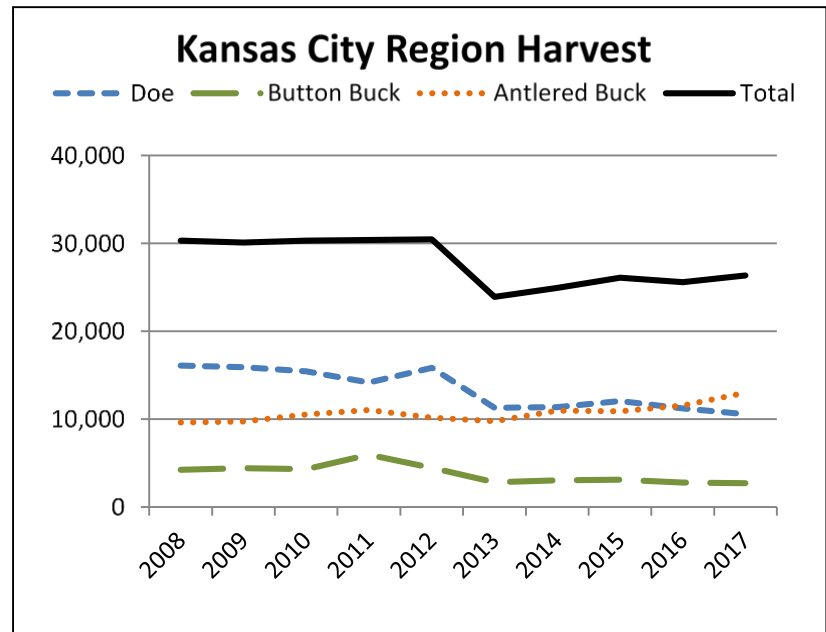
County	Trips/kill
MORGAN	5.8
CALLAWAY	6.2
HOWARD	7.1
AUDRAIN	7.3
SALINE	7.3
BOONE	8.0
OSAGE	8.3
COOPER	8.4
CAMDEN	8.7
GASCONADE	9.2
MILLER	9.5
MONTGOMERY	9.9
MARIES	10.6
COLE	14.8

Number of trips per kill for firearms deer permittees from survey respondents in 2016.

No. of Conservation Areas that allow deer hunting	Conservation Areas by allowed deer hunting methods			No. of Conservation Areas that allow use of antlerless permits
	Archery and Firearms	Muzzleloader and Archery	Archery Only	
66	28	16	22	43

Kansas City Region Deer Summary

Total harvest for the Kansas City Region was 2% higher in 2017 than in 2016 at 26,341 deer harvested (**Table 1**). Over the past 10 years, the region's deer population has been fairly stable, with a slight decrease in 2013 following a severe outbreak of hemorrhagic disease in 2012. Overall, the population is well below the biological carrying capacity for the Kansas City Region, and according to recent survey results, deer populations remain at, or slightly below, the socially acceptable level (**Figure 5**). Two counties in the southeast portion of the region were added into the CWD Management Zone after CWD was confirmed in a portion of St. Clair County in 2016.



CWD Status by County

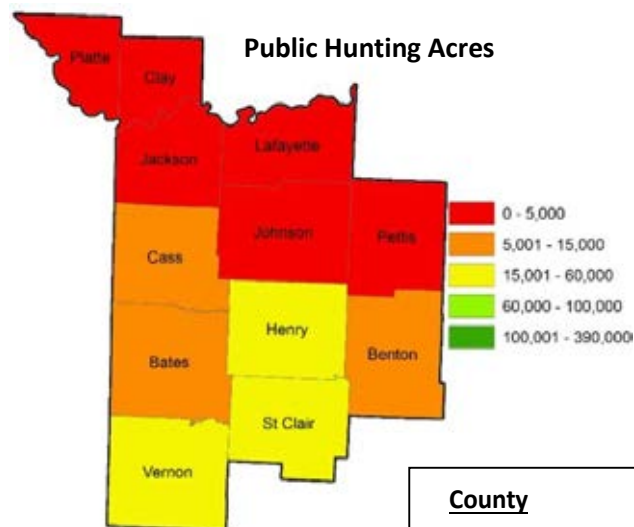


2017 Top 5 Harvest Counties

Benton – 3,960
 St. Clair – 3,535
 Henry – 2,922
 Vernon – 2,586
 Johnson – 2,442

2017 Lowest and Highest Deer Harvest per Square Mile

Lafayette – 2.10
 Benton – 5.95



County	Trips/kill
VERNON	6.6
HENRY	8.7
BENTON	9.0
SAINT CLAIR	9.2
BATES	11.0
PLATTE	11.2
JOHNSON	12.3
CASS	12.3
CLAY	12.4
LAFAYETTE	14.3
PETTIS	14.8
JACKSON	15.2

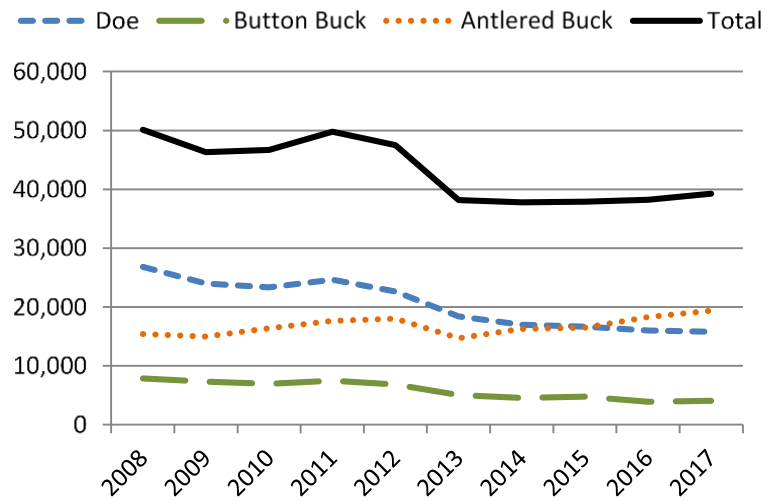
Number of trips per kill for firearms deer permittees from survey respondents in 2016.

No. of Conservation Areas that allow deer hunting	Conservation Areas by allowed deer hunting methods			No. of Conservation Areas that allow use of antlerless permits
	Archery and Firearms	Muzzleloader and Archery	Archery Only	
87	36	28	23	59

Northeast Region Deer Summary

Deer harvest totals in the Northeast Region have remained relatively stable following a substantial decrease in 2013. Harvest in 2017 was 3% higher than 2016, 3% higher than the 5-year mean, and 9% lower than the 10-year mean (**Table 1**). Throughout the Northeast Region, deer populations seem to be stable or slightly decreasing (**Figure 6**). Much of this region remains within a CWD Management Zone due to positive detections in Macon and Adair Counties, but fortunately, no new counties have been added for this region. The combination of stable deer populations, abundant forage on high quality soils, and the six counties under the antler point restriction contribute to a high quality deer hunting experience in Northeast Missouri.

Northeast Region Harvest



CWD Status by County



2017 Top 5 Harvest Counties

Macon – 4,003
 Pike – 3,897
 Monroe – 3,031
 Scotland – 2,777
 Adair – 2,712

2017 Lowest and Highest Deer Harvest per Square Mile

Sullivan – 4.24
 Scotland – 6.72

Public Hunting Acres



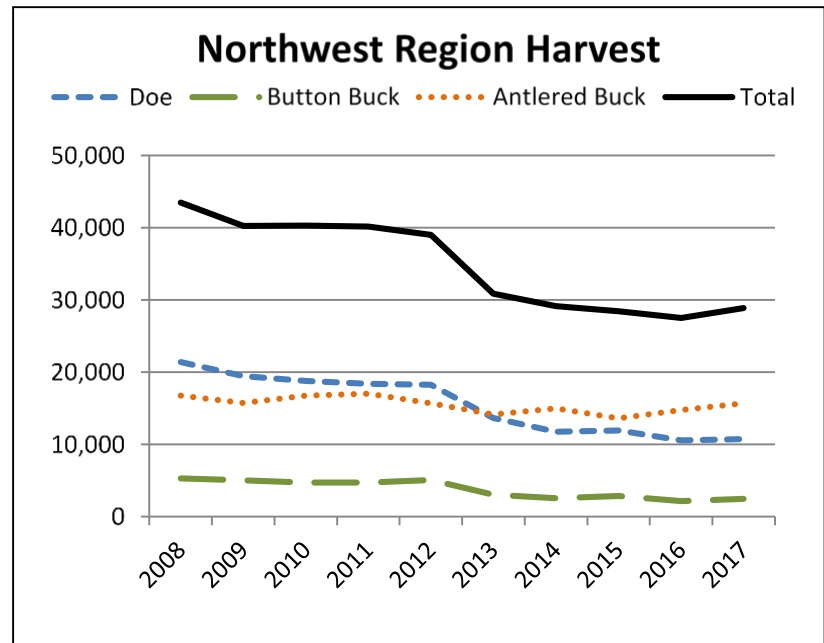
County	Trips/kill
SCHUYLER	5.3
PUTNAM	5.4
KNOX	5.5
SCOTLAND	6.4
SULLIVAN	6.4
SHELBY	6.5
LEWIS	6.9
MACON	7.0
PIKE	7.3
MARION	7.5
MONROE	7.6
CLARK	7.9
ADAIR	8.9
RANDOLPH	9.1
RALLS	13.5

Number of trips per kill for firearms deer permittees from survey respondents in 2016.

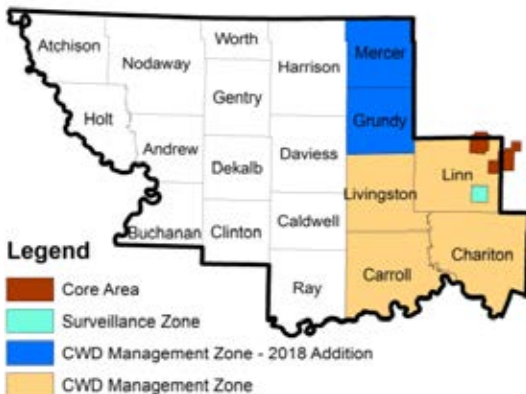
No. of Conservation Areas that allow deer hunting	Conservation Areas by allowed deer hunting methods			No. of Conservation Areas that allow use of antlerless permits
	Archery and Firearms	Muzzleloader and Archery	Archery Only	
62	39	10	13	52

Northwest Region Deer Summary

Total harvest for the Northwest Region was 5% higher than 2016, equal to the 5-year average, and 17% below the 10-year average (**Table 1**). Over the past 10 years, deer population estimates and harvest in the Northwest Region have declined more sharply than any other region (**Figures 4 & 6**). These declines are attributed to severe hemorrhagic outbreaks in 2012, as well as historically liberal antlerless harvest and habitat loss through conversion of CRP to row-crop agriculture. Hemorrhagic outbreaks tend to be more severe in Northern Missouri, where outbreaks are less frequent and more deer are naïve to the virus. Mercer and Grundy counties have been added to the CWD Management Zone for 2018.



CWD Status by County



2017 Top 5 Harvest Counties

Harrison – 2,873
Linn – 2,624
Davies – 2,232
Mercer – 2,164
Carroll – 2,007

2017 Lowest and Highest Deer Harvest per Square Mile

Atchison – 1.34
Mercer – 5.07



County	Trips/kill
DAVIESS	5.9
MERCER	6.1
GRUNDY	6.2
GENTRY	6.4
ANDREW	7.0
CLINTON	7.3
LIVINGSTON	7.4
LINN	7.6
NODAWAY	7.7
WORTH	8.1
ATCHISON	8.1
HARRISON	8.5
CARROLL	9.0
CHARITON	9.1
DEKALB	10.4
HOLT	11.0
CALDWELL	11.7
RAY	14.4
BUCHANAN	16.2

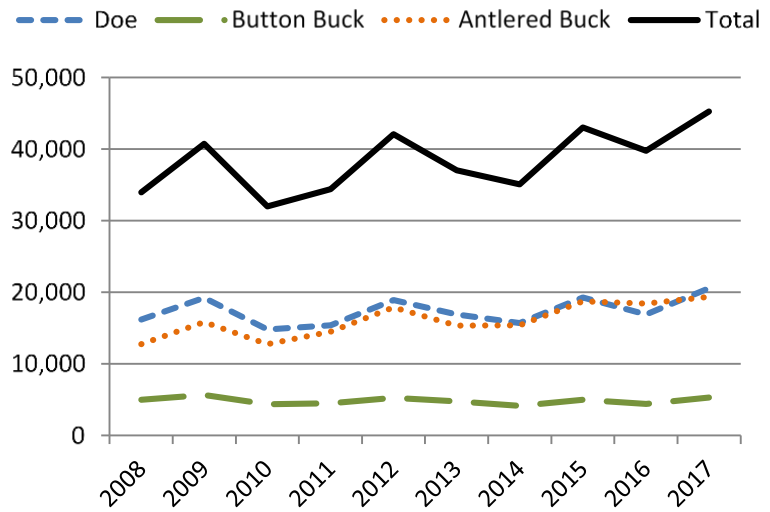
Number of trips per kill for firearms deer permittees from survey respondents in 2016.

No. of Conservation Areas that allow deer hunting	Conservation Areas by allowed deer hunting methods			No. of Conservation Areas that allow use of antlerless permits
	Archery and Firearms	Muzzleloader and Archery	Archery Only	
77	41	22	14	45

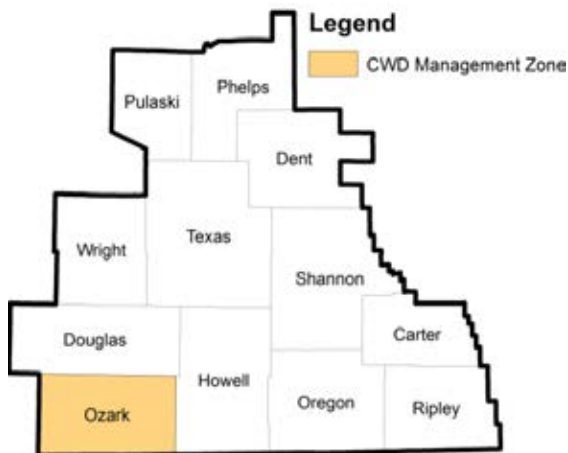
Ozark Region Deer Summary

In heavily forested regions like the Missouri Ozarks, acorn production can have a substantial impact on annual deer harvest. During years of low acorn production, deer movement and harvest increase. Conversely, high acorn production leads to lower deer movement and lower harvest. Acorn production in 2017 was fair across much of the Ozarks contributing to an increase in harvest. Harvest in 2017 was 14% higher than 2016 and 18% higher than the 10-year average (**Table 1**). The increasing trend in harvest is helped by a slowly increasing deer population (**Figures 3 & 6**). The Ozark Region has the most public land acres open to public hunting.

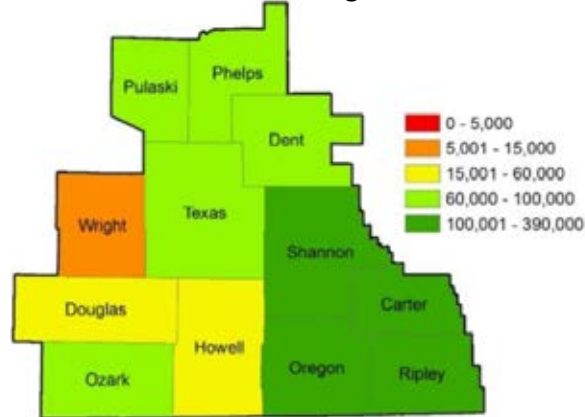
Ozark Region Harvest



CWD Status by County



Public Hunting Acres



2017 Top 5 Harvest Counties

Howell – 6,187
Texas – 5,623
Oregon – 4,878
Dent – 4,060
Ripley – 3,576

2017 Lowest and Highest Deer Harvest per Square Mile

Douglas – 4.23
Howell – 6.91

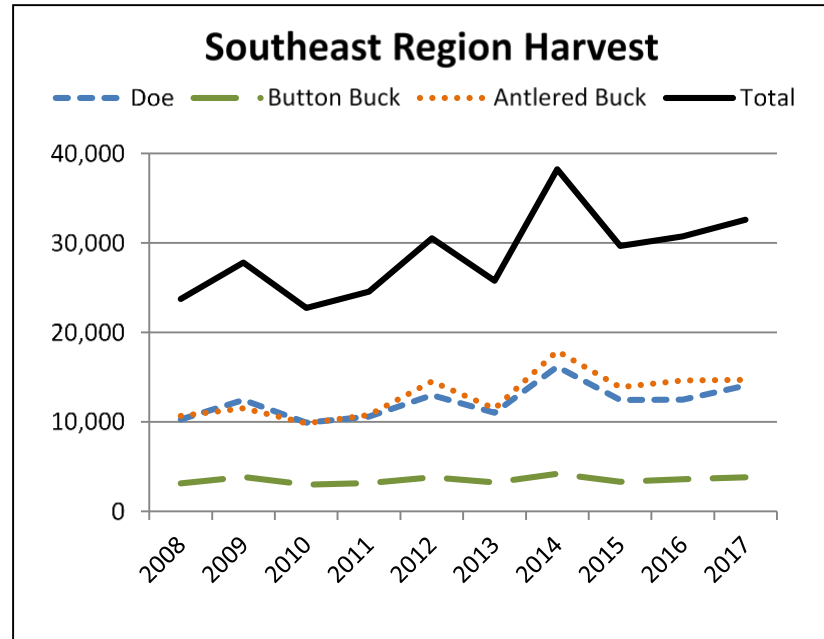
County	Trips/kill
WRIGHT	5.8
OREGON	6.0
OZARK	6.0
TEXAS	8.2
RIPLEY	8.3
PULASKI	8.4
SHANNON	8.5
CARTER	8.8
HOWELL	8.9
DENT	8.9
DOUGLAS	9.0
PHELPS	11.3

Number of trips per kill for firearms deer permittees from survey respondents in 2016.

No. of Conservation Areas that allow deer hunting	Conservation Areas by allowed deer hunting methods			No. of Conservation Areas that allow use of antlerless permits
	Archery and Firearms	Muzzleloader and Archery	Archery Only	
67	43	0	24	64

Southeast Region Deer Summary

The Southeast has some of the most diverse habitat in the state causing the deer population to vary dramatically throughout the Region. There are heavily forested areas with abundant cover and food, while the “boot-heel” has a stronger agricultural component. Overall, the deer population in the Southeast Region has been slowly increasing over the past several years. Likewise, the total harvest number increased by 6% in 2017 compared to 2016, which is a 4% increase from the 5-year average and a 14% increase from the 10-year average (**Table 1**). Four counties have been added to the CWD Management Zone for 2018 in the Southeast Region.



CWD Status by County



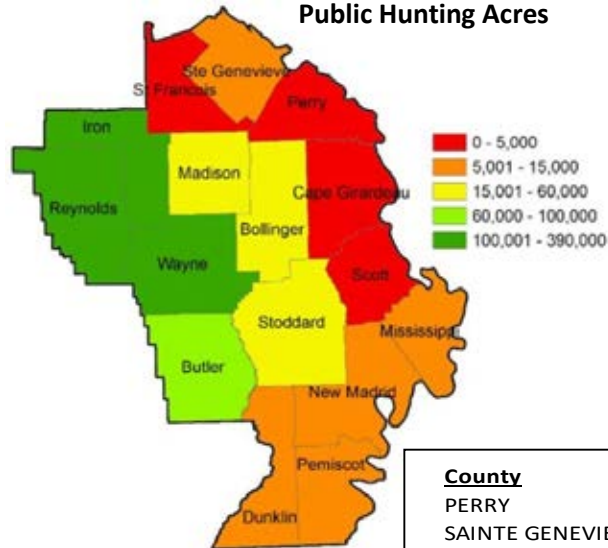
2017 Top 5 Harvest Counties

Bollinger – 4,636
Wayne – 4,310
Perry – 3,055
Cape Girardeau – 3,022
Sainte Genevieve – 2,742

2017 Lowest and Highest Deer Harvest per Square Mile

Pemiscot – 0.42
Bollinger – 7.80

Public Hunting Acres



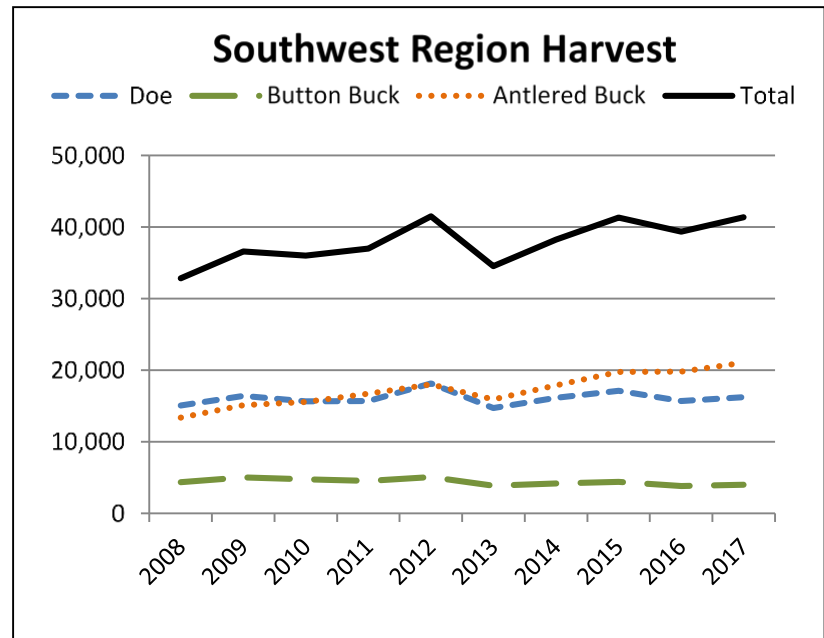
County	Trips/kill
PERRY	6.8
SAINTE GENEVIEVE	7.7
REYNOLDS	8.0
NEW MADRID	9.0
SAINT FRANCOIS	9.4
DUNKLIN	9.6
CAPE GIRARDEAU	10.0
IRON	10.8
SCOTT	11.0
BOLLINGER	11.1
WAYNE	11.2
MADISON	11.4
STODDARD	12.0
BUTLER	17.7
MISSISSIPPI	25.5
PEMISCOT	75.4

Number of trips per kill for firearms deer permittees from survey respondents in 2016.

No. of Conservation Areas that allow deer hunting	Conservation Areas by allowed deer hunting methods			No. of Conservation Areas that allow use of antlerless permits
	Archery and Firearms	Muzzleloader and Archery	Archery Only	
83	37	19	27	69

Southwest Region Deer Summary

During the 2017 hunting season, 41,356 deer were harvested in the Southwest Region. This total was 5% higher than the 2016 harvest, 6% higher than the 5-year average, and 9% higher than the 10-year average (**Table 1**). The deer population in this area increased over the past 10 years with current population trends appearing to be stable and at socially acceptable levels (**Figures 5 & 6**). McDonald County is a new addition to the CWD Management Zone for 2018 joining Barry, Stone, and Taney Counties due to the close proximity of a CWD positive deer in Arkansas. For a map of the locations for CWD positive deer detected in Arkansas see page 32.

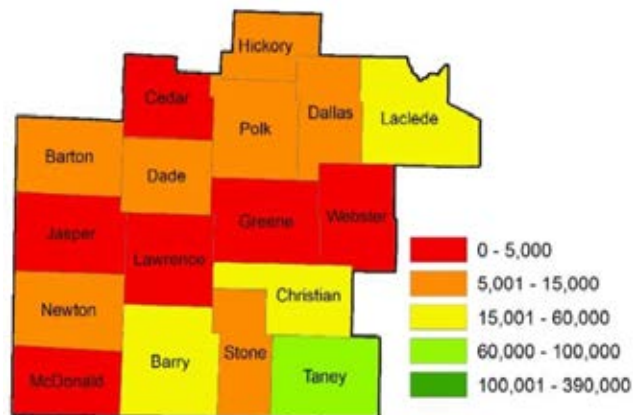


Legend

- CWD Status by County**
- Core Area
 - CWD Management Zone - 2018 Addition
 - CWD Management Zone



Public Hunting Acres



2017 Top 5 Harvest Counties

Laclede – 4,097
 Dallas – 3,416
 Webster – 3,063
 Greene – 2,909
 Polk – 2,712

2017 Lowest and Highest Deer Harvest per Square Mile

Barton – 3.02
 Hickory – 6.57

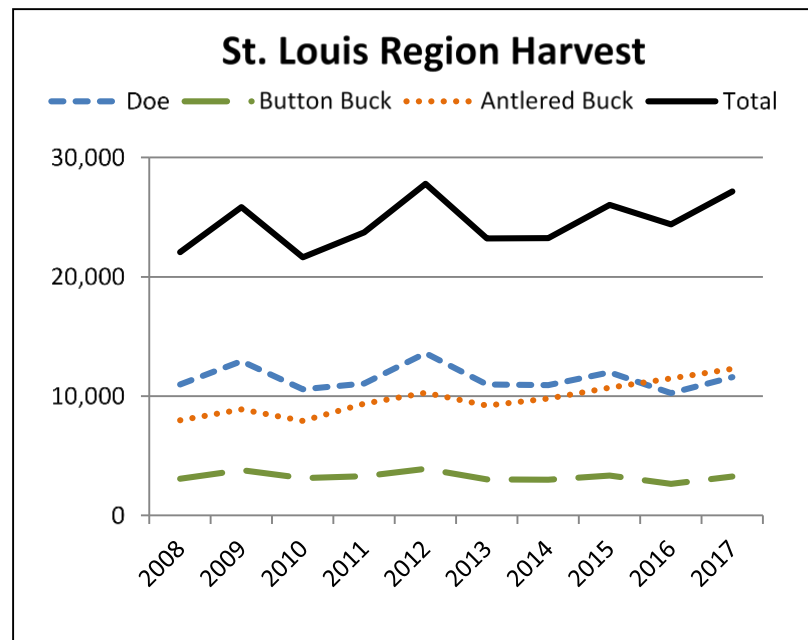
County	Trips/kill
MCDONALD	6.8
DALLAS	7.0
JASPER	7.3
LACLEDE	7.6
WEBSTER	7.7
DADE	7.7
GREENE	7.8
NEWTON	7.8
POLK	8.0
HICKORY	8.5
BARRY	8.9
BARTON	9.2
CEDAR	9.8
TANEY	10.5
LAWRENCE	10.6
CHRISTIAN	11.7
STONE	13.2

Number of trips per kill for firearms deer permittees from survey respondents in 2016.

No. of Conservation Areas that allow deer hunting	Conservation Areas by allowed deer hunting methods			No. of Conservation Areas that allow use of antlerless permits
	Archery and Firearms	Muzzleloader and Archery	Archery Only	
83	37	19	27	69

St. Louis Region Deer Summary

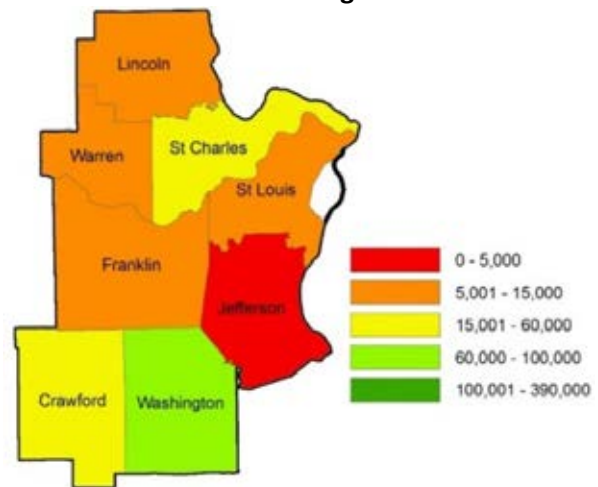
A total of 27,165 deer were harvested in the St. Louis region in 2017, which was 11% higher than the 2016 harvest, 10% higher than the 5-year average, and 11% higher than the 10-year average (**Table 1**). We estimate the deer population is fairly stable across the region (**Figure 6**). The MDC continues to work to address issues associated with large numbers of deer within urban areas in the St. Louis Region. Almost all of the St. Louis Region is currently within the CWD Management Zone with recent detections of CWD-positive deer within Franklin County and Jefferson County. Lincoln County is the only county within the region not included in a CWD Management Zone at this time (**see**



CWD Status by County



Public Hunting Acres



2017 Top 5 Harvest Counties

Franklin – 5,960
 Jefferson – 4,492
 Crawford – 3,959
 Lincoln – 3,279
 Washington – 2,815

2017 Lowest and Highest Deer

Harvest per Square Mile

Washington – 3.85
 St. Louis – 8.29

County	Trips/kill
SAINT LOUIS	6.8
JEFFERSON	7.4
CRAWFORD	7.8
SAINT CHARLES	8.7
WARREN	9.6
FRANKLIN	11.2
LINCOLN	11.5
WASHINGTON	13.1

Number of trips per kill for firearms deer permittees from survey respondents in 2016.

No. of Conservation Areas that allow deer hunting	Conservation Areas by allowed deer hunting methods			No. of Conservation Areas that allow use of antlerless permits
	Archery and Firearms	Muzzleloader and Archery	Archery Only	
40	17	5	18	30

County Deer Population Trends

Deer populations are highly variable within a state, region, and even county due to variation in habitat, harvest regulations, local hunter goals and practices, hunter density, amount of public and private land, and disease outbreaks (e.g., hemorrhagic disease). Therefore, county-wide assessments of deer population trends are not applicable to every local situation but are a general representation of the current status and population trend for each respective county.

The Cervid Program evaluates a variety of data to assess county-specific deer populations and for regulation development including:

- **Harvest data**—The total number and composition (antlered bucks, does, and button bucks) of harvested deer.
- **Population data**— Population simulations incorporating harvest, age-at-harvest data, and estimated survival/reproduction rates.
- **Hunter, landowner, and staff surveys** — Hunters and landowners are randomly selected to receive mail surveys.
- **Public & staff input** — Input is received via email, the MDC website, public meetings, and phone calls.



Social data is critical when assessing the deer population in relation to public acceptance levels. In cooperation with the USDA, we send out surveys statewide to 9,000 agricultural producers to assess perceptions and attitudes toward deer populations and regulations. Additionally, we survey 35,000 archery hunters and 50,000 firearm hunters in order to estimate hunter effort, hunter density, and opinions concerning deer populations and regulations. We also incorporate public comments received throughout the year via the web, letters, calls, social media, public meetings, emails, and any other feedback.

The Deer Program reviews all this information annually on a county-by-county basis to classify the deer population status and trends (**Figures 5 & 6**). Socially acceptable levels (cultural carrying capacity) are the first thing we look at when classifying the status of the deer population. While biological carrying capacity, or the habitat's limitations on the number of deer that can be supported, is included within our assessment, generally cultural carrying capacity will be met first. We aim for this goal because agricultural producers, motorists, and other stakeholders will often not tolerate deer population levels at biological carrying capacity. By monitoring the population trends for each county, we are able to gain an understanding of where the population is headed and adjust harvest regulations accordingly.



Deer populations are fairly stable across most of Missouri and are at, or slightly below, socially acceptable levels (Figure 6). Exceptions include portions of northern Missouri that are still recovering from a severe outbreak of hemorrhagic disease that occurred in 2012, as well as some counties in southeast Missouri where deer populations have historically been very low but have been slowly increasing in recent years.

The goal of the MDC is to maintain stable deer populations within each county that are at a socially acceptable level for the majority of interested stakeholders.

County Deer Statistics

Figure 3. Percent change in the county level deer harvest in Missouri in 2017 compared to the 5-year average.

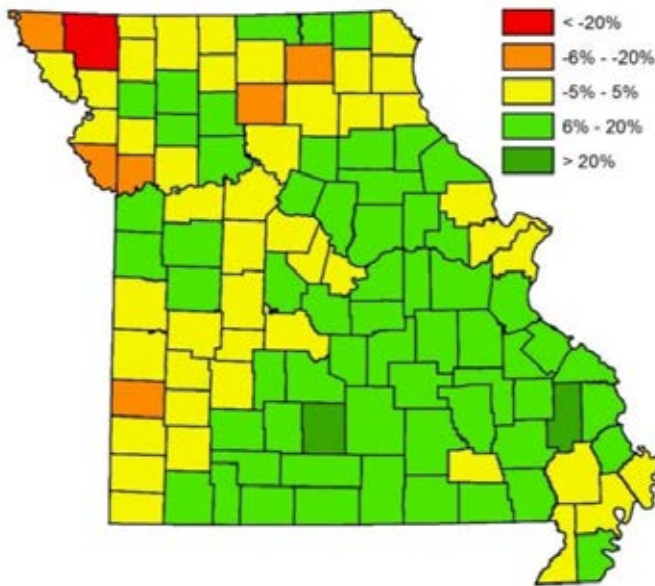


Figure 4. Percent change in the county level deer harvest in Missouri in 2017 compared to the 10-year average

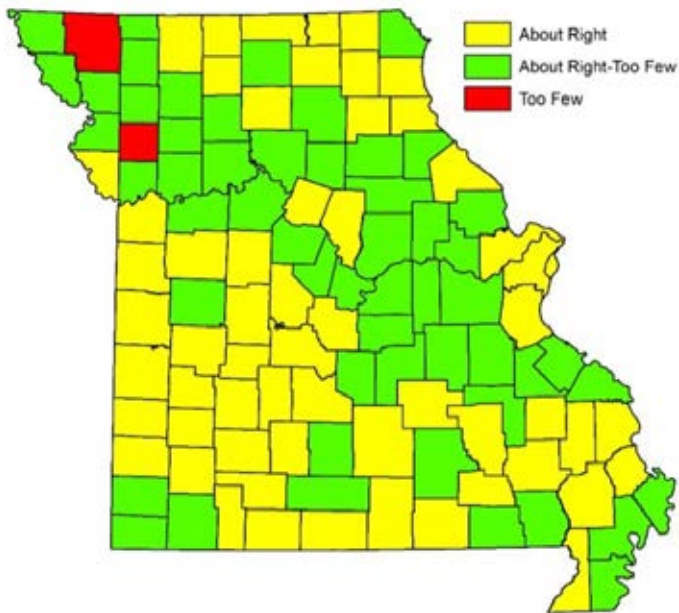
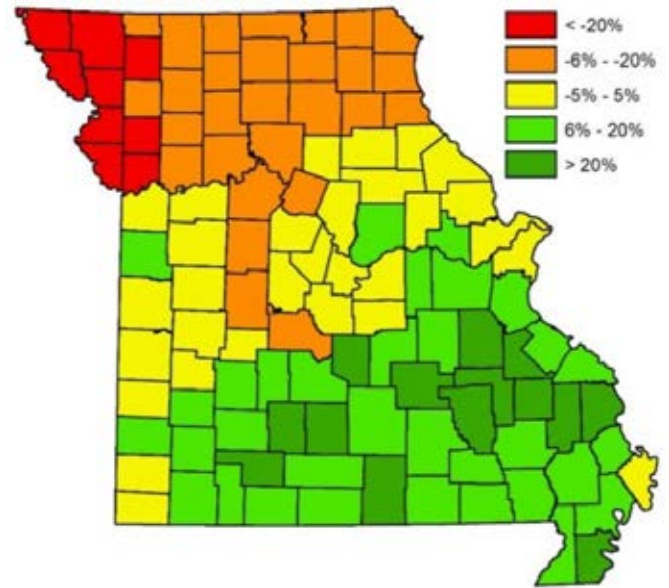


Figure 5. County-specific deer populations, in Missouri, based on socially acceptable levels, 2017

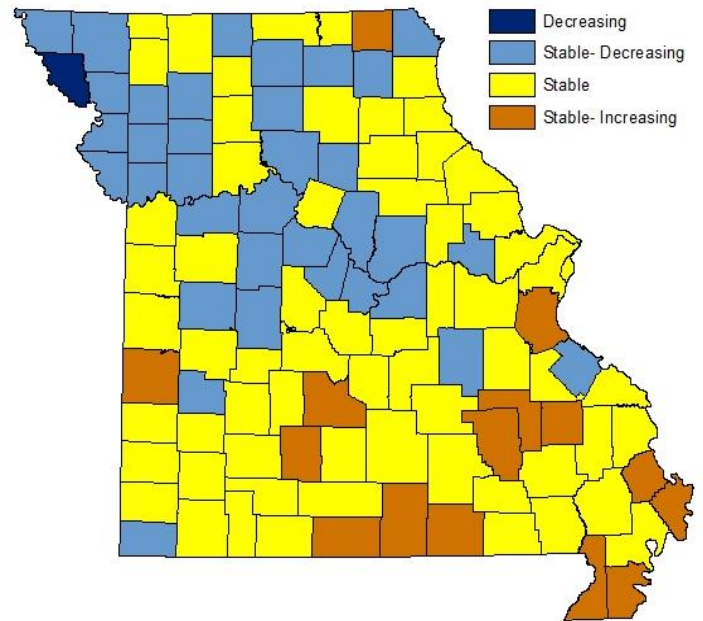


Figure 6. County-specific deer population trends in Missouri, 2017.

Table 5. County Deer Harvest Totals

County	Archery				Firearms				Totals*			
	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total
Adair	244	42	253	539	1,129	244	799	2,172	1,373	286	1,053	2,712
Andrew	76	11	82	169	463	105	343	911	539	116	425	1,080
Atchison	76	13	62	151	337	45	171	553	413	58	233	704
Audrain	108	45	159	312	761	201	636	1,598	869	246	795	1,910
Barry	189	40	164	393	1,019	213	659	1,891	1,208	253	823	2,284
Barton	125	28	140	293	674	139	559	1,372	800	167	701	1,668
Bates	134	25	149	308	814	155	642	1,611	948	180	791	1,919
Benton	342	69	305	716	1,785	312	1,136	3,233	2,129	384	1,447	3,960
Bollinger	251	113	491	855	1,587	501	1,693	3,781	1,838	614	2,184	4,636
Boone	303	53	308	664	1,278	215	923	2,416	1,582	268	1,234	3,084
Buchanan	44	8	58	110	323	51	233	607	367	59	291	717
Butler	258	52	238	548	841	150	593	1,584	1,102	202	833	2,137
Caldwell	91	13	84	188	596	120	423	1,139	687	133	507	1,327
Callaway	362	95	429	886	1,961	457	1,667	4,085	2,347	557	2,116	5,020
Camden	301	103	374	778	1,267	381	1,163	2,811	1,568	484	1,537	3,589
Cape Girardeau	133	59	328	520	1,133	259	1,108	2,500	1,266	319	1,437	3,022
Carrol	144	22	139	305	1,037	133	531	1,701	1,182	155	670	2,007
Carter	205	93	299	597	901	171	557	1,629	1,141	281	890	2,312
Cass	198	28	205	431	905	170	642	1,717	1,103	198	850	2,151
Cedar	218	35	170	423	1,053	175	662	1,890	1,278	217	842	2,337
Chariton	104	21	105	230	957	152	573	1,682	1,066	173	679	1,918
Christian	179	43	253	475	935	168	713	1,816	1,114	211	966	2,291
Clark	272	35	210	517	981	203	718	1,902	1,253	238	928	2,419
Clay	156	23	143	322	306	36	173	515	483	62	334	879
Clinton	67	13	50	130	311	58	231	600	381	71	285	737
Cole	124	29	127	280	676	162	531	1,369	800	191	661	1,652
Cooper	158	30	170	358	1,019	198	739	1,956	1,177	228	909	2,314
Crawford	239	97	315	651	1,451	426	1,430	3,307	1,691	523	1,745	3,959
Dade	106	10	95	211	680	133	468	1,281	786	143	563	1,492
Dallas	224	65	275	564	1,399	343	1,109	2,851	1,624	408	1,384	3,416
Daviess	162	34	154	350	962	179	740	1,881	1,125	213	894	2,232
DeKalb	74	22	67	163	464	81	301	846	539	103	368	1,010
Dent	162	55	302	519	1,408	458	1,673	3,539	1,570	513	1,977	4,060

*Includes Managed Hunt Numbers

Table 5. County Deer Harvest Totals

County	Archery				Firearms				Totals*			
	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total
Douglas	139	64	200	403	1,405	345	1,221	2,971	1,544	409	1,421	3,374
Dunklin	43	12	47	102	207	24	103	334	250	36	150	436
Franklin	370	127	505	1,002	2,425	547	1,982	4,954	2,796	674	2,490	5,960
Gasconade	213	66	281	560	1,724	344	1,337	3,405	1,937	410	1,618	3,965
Gentry	114	7	97	218	619	77	401	1,097	733	84	498	1,315
Green	337	72	362	771	1,103	205	794	2,102	1,443	286	1,180	2,909
Grundy	119	10	113	242	700	127	466	1,293	819	137	579	1,535
Harrison	279	38	258	575	1,279	209	810	2,298	1,558	247	1,068	2,873
Henry	142	56	287	485	1,141	296	999	2,436	1,284	352	1,286	2,922
Hickory	183	48	167	398	1,190	217	745	2,152	1,373	265	912	2,550
Holt	86	16	90	192	405	73	252	730	491	89	342	922
Howard	166	24	152	342	978	175	709	1,862	1,147	210	884	2,241
Howell	330	96	457	883	2,219	596	2,488	5,303	2,549	692	2,946	6,187
Iron	111	25	86	222	684	166	397	1,247	795	191	483	1,469
Jackson	300	59	320	679	417	63	280	760	781	161	783	1,725
Jasper	269	54	249	572	1,009	150	660	1,819	1,278	204	909	2,391
Jefferson	421	146	607	1,174	1,572	385	1,361	3,318	1,993	531	1,968	4,492
Johnson	154	32	197	383	987	208	747	1,942	1,141	269	1,032	2,442
Knox	234	41	206	481	1,021	230	759	2,010	1,255	272	965	2,492
Laclede	229	79	355	663	1,744	360	1,330	3,434	1,973	439	1,685	4,097
Lafayette	84	14	90	188	513	121	411	1,045	597	135	501	1,233
Lawrence	148	25	163	336	830	133	496	1,459	978	158	659	1,795
Lewis	170	17	161	348	845	176	693	1,714	1,016	193	854	2,063
Lincoln	231	77	299	607	1,279	327	1,065	2,671	1,510	404	1,365	3,279
Linn	217	35	233	485	1,139	186	813	2,138	1,357	221	1,046	2,624
Livingston	135	15	103	253	846	140	544	1,530	981	155	648	1,784
Macon	329	75	347	751	1,667	357	1,228	3,252	1,996	432	1,575	4,003
Madison	162	60	231	453	872	214	689	1,775	1,034	274	920	2,228
Maries	155	53	186	394	891	252	805	1,948	1,046	305	991	2,342
Marion	137	36	146	319	738	164	596	1,498	875	200	742	1,817
McDonald	192	16	135	343	782	113	486	1,381	974	129	621	1,724

*Includes Managed Hunt Numbers

Table 5. County Deer Harvest Totals

County	Archery				Firearms				Totals*			
	Antlered Buck	Button Buck	Doe	Totals	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total
Mercer	270	33	217	520	960	128	556	1,644	1,230	161	773	2,164
Miller	202	52	226	480	1,188	296	1,122	2,606	1,390	348	1,351	3,089
Mississippi	29	6	36	71	161	13	75	249	190	19	111	320
Moniteau	81	22	97	200	691	138	503	1,332	772	160	600	1,532
Monroe	195	60	250	505	1,128	346	1,003	2,477	1,323	419	1,289	3,031
Montgomery	162	61	231	454	1,113	321	1,015	2,449	1,276	382	1,247	2,905
Morgan	264	68	320	652	1,535	410	1,335	3,280	1,799	478	1,655	3,932
New Madrid	33	9	47	89	193	27	84	304	226	36	131	393
Newton	269	44	205	518	917	159	614	1,690	1,191	206	829	2,226
Nodaway	146	15	100	261	770	106	420	1,296	916	121	520	1,557
Oregon	267	76	459	802	1,680	486	1,909	4,075	1,947	563	2,368	4,878
Osage	245	49	348	642	1,796	394	1,454	3,644	2,041	443	1,802	4,286
Ozark	178	31	232	441	1,306	268	1,173	2,747	1,503	300	1,420	3,223
Pemiscot	24	8	29	61	70	15	50	135	94	23	79	196
Perry	101	45	288	434	1,077	317	1,227	2,621	1,178	362	1,515	3,055
Pettis	117	40	144	301	874	196	686	1,756	991	236	830	2,057
Phelps	156	58	284	498	1,034	385	1,156	2,575	1,190	444	1,442	3,076
Pike	254	71	353	678	1,506	368	1,330	3,204	1,763	439	1,695	3,897
Platte	132	21	155	308	366	60	198	624	498	81	353	932
Polk	173	54	232	459	1,197	210	846	2,253	1,370	264	1,078	2,712
Pulaski	206	74	347	627	949	279	916	2,144	1,155	353	1,263	2,771
Putnam	357	35	295	687	1,099	145	774	2,018	1,456	180	1,070	2,706
Ralls	193	47	188	428	886	208	689	1,783	1,079	255	878	2,212
Randolph	182	39	142	363	1,065	214	783	2,062	1,247	253	925	2,425
Ray	90	10	95	195	676	116	433	1,225	766	126	528	1,420
Reynolds	194	52	152	398	1,028	179	662	1,869	1,222	231	814	2,267
Ripley	252	86	345	683	1,281	352	1,259	2,892	1,533	439	1,604	3,576
St. Charles	220	47	248	515	649	149	490	1,288	970	247	868	2,085
St. Clair	257	63	279	599	1,549	328	1,056	2,933	1,807	392	1,336	3,535
St. Francois	157	78	291	526	866	268	936	2,070	1,024	346	1,227	2,597
St. Louis	382	112	544	1,038	326	82	270	678	750	206	878	1,834

* Includes Managed Hunt Numbers

Table 5. County Deer Harvest Totals

County	Archery				Firearms				Totals*			
	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total	Antlered Buck	Button Buck	Doe	Total
Ste. Genevieve	92	52	211	355	1,087	259	1,041	2,387	1,179	311	1,252	2,742
Saline	103	28	142	273	762	143	561	1,466	865	171	703	1,739
Schuyler	126	27	118	271	652	154	573	1,379	778	181	691	1,650
Scotland	267	36	240	543	1,058	245	929	2,232	1,326	281	1,170	2,777
Scott	56	13	69	138	312	64	223	599	368	77	292	737
Shannon	176	54	196	426	1,217	331	1,223	2,771	1,401	385	1,422	3,208
Shelby	212	43	187	442	997	225	791	2,013	1,209	268	978	2,455
Stoddard	170	93	297	560	734	143	585	1,462	916	239	899	2,054
Stone	133	41	178	352	720	123	525	1,368	853	164	703	1,720
Sullivan	238	25	249	512	1,173	145	748	2,066	1,411	170	997	2,578
Taney	207	38	263	508	1,136	167	870	2,173	1,343	205	1,133	2,681
Texas	244	82	385	711	2,214	512	2,184	4,910	2,460	594	2,569	5,623
Vernon	208	59	263	530	1,035	231	772	2,038	1,250	292	1,044	2,586
Warren	199	55	237	491	1,155	247	847	2,249	1,354	303	1,084	2,741
Washington	177	64	224	465	1,056	323	971	2,350	1,233	387	1,195	2,815
Wayne	380	128	503	1,011	1,625	422	1,229	3,276	2,016	553	1,741	4,310
Webster	190	55	246	491	1,295	262	1,015	2,572	1,485	317	1,261	3,063
Worth	122	13	107	242	416	43	282	741	538	56	389	983
Wright	167	56	234	457	1,225	261	1,039	2,525	1,392	317	1,273	2,982
Regions												
Central	2,947	778	3,550	7,275	17,640	4,087	14,500	36,227	20,616	4,881	18,103	43,600
Kansas City	2,224	489	2,537	5,250	10,692	2,176	7,742	20,610	13,012	2,742	10,587	26,341
Northeast	3,410	629	3,345	7,384	15,945	3,424	12,413	31,782	19,360	4,067	15,810	39,237
Northwest	2,416	349	2,214	4,979	13,260	2,129	8,523	23,912	15,688	2,478	10,743	28,909
Ozark	2,482	825	3,740	7,047	16,839	4,444	16,798	38,081	19,385	5,290	20,595	45,270
Southeast	2,194	805	3,344	6,343	12,477	3,021	10,695	26,193	14,698	3,833	14,068	32,599
Southwest	3,371	747	3,652	7,770	17,683	3,270	12,551	33,504	21,071	4,036	16,249	41,356
St. Louis	2,239	725	2,979	5,943	9,913	2,486	8,416	20,815	12,297	3,275	11,593	27,165
Grand Total												
Statewide	21,283	5,347	25,361	51,991	114,449	25,037	91,638	231,124	136,127	30,602	117,748	284,477

*Includes Managed Hunt Numbers

Public Land Deer Hunting

Our survey results indicate that about 20% of Missouri's almost 500,000 deer hunters will spend at least some of the hunting season on public land. Considering only about 7% of Missouri is publicly owned, that puts a lot of hunting pressure on a very small amount of land! Beginning in 2016, we added a question to Telecheck asking successful hunters if they harvested their deer on public land. We learned that about 10% of the total deer harvest occurs on public land. Managing deer hunting on public land is complicated by high hunter densities, diverse hunter values and opinions about regulations, and other public use activities. Based on a study conducted by MDC during 2005–2012, the Department found that for most hunters, the opportunity to see and harvest a deer is important, affecting how hunters select an area to hunt, and their satisfaction with the hunting experience. The results suggest that conservation areas with restrictive regulations (archery only, archery/muzzleloader methods, and bucks only) increase opportunities to see deer and produce more satisfied hunters than areas with more liberal regulations (statewide, open during antlerless portion). However, for some hunters the opportunity to hunt deer and use whatever permits are available in the county is most important. Beginning in 2016, we simplified Conservation Area deer regulations to 3 options (Archery and Firearms, Muzzleloader and Archery, or Archery Only) with the additional option for managers to allow or not allow antlerless tags to be used on the area. We strive to balance providing as many opportunities to hunt as possible while maintaining healthy deer populations and quality hunting experiences. See Table 6 for the diverse range of deer hunting options we provide on public ground. For a list of Conservation Area Deer Regulations, see the 2018 Fall Deer and Turkey Hunting Booklet available at mdc.mo.gov.

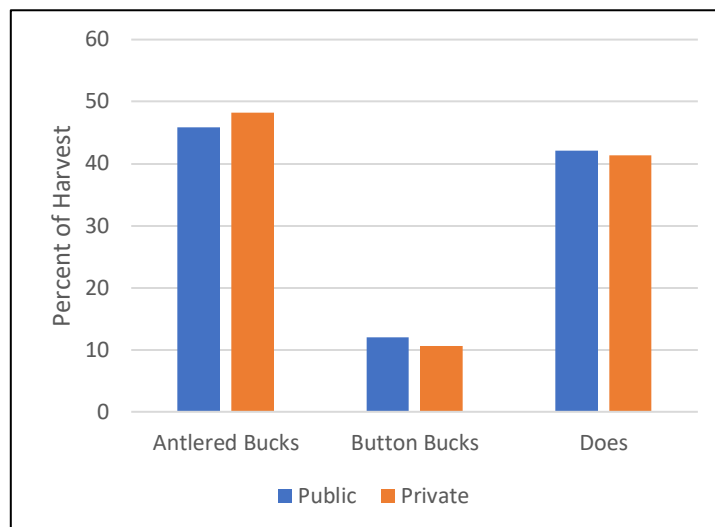


Figure 7. Deer age and sex breakdown on public and private lands.

Table 6. Regional Breakdown of Conservation Areas Allowing Deer Hunting

Region	No. of Conservation Areas that allow deer hunting	Conservation Areas by allowed deer hunting methods			No. of Conservation Areas that allow use of antlerless permits
		Archery and Firearms	Muzzleloader and Archery	Archery Only	
Northwest	77	41	22	14	45
Northeast	62	39	10	13	52
Kansas City	87	36	28	23	59
Central	66	28	16	22	43
St. Louis	40	17	5	18	30
Southwest	83	37	19	27	69
Ozark	67	43	0	24	64
Southeast	71	33	12	26	28
Total	553	274	112	167	390

Managed Deer Hunt Summary

Managed deer hunts are an important tool used by land managers and cooperators to regulate deer populations on public land and to provide unique hunting opportunities. Missouri offered 106 managed deer hunts from mid-September through mid-January 2017, including 13 hunts exclusively for youth and 18 for those with disabilities. Managed deer hunt participants harvested 1,362 deer during the 2017 season; a 2% reduction from 2016. Whetstone Creek Conservation Area had the highest firearm hunter success rate, with 72% of the 25 hunters harvesting at least 1 deer and a total of 30 deer harvested. **For more details regarding the 2017 managed hunt results, contact your regional MDC office (page 8) or visit mdc.mo.gov.**

Adjusting Management to Changing Deer & Hunter Populations

Advancements in Knowledge and Recent Challenges

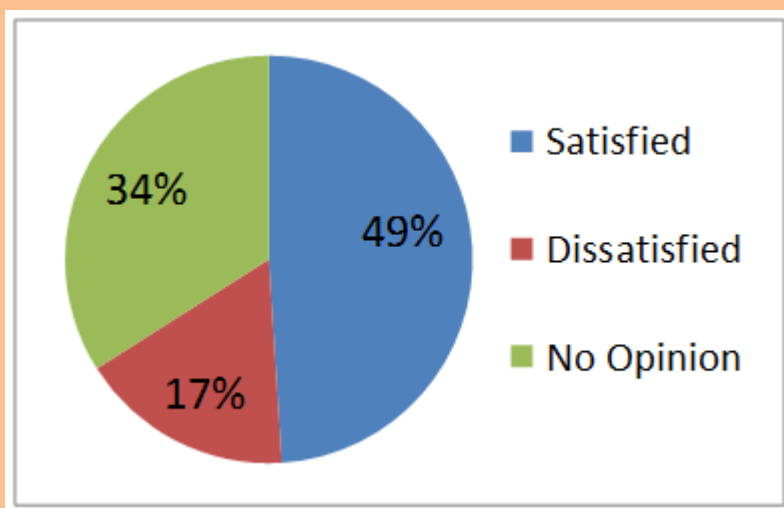
As technology advances, we are certainly able to learn more about wildlife than ever before. With greater insight, the MDC has the opportunity to address some more complicated management objectives with respect to Missouri's natural resources, including white-tailed deer. Prior to the 1980's, deer management efforts in Missouri were focused on re-establishing and growing healthy populations statewide. By the late 1980's, this goal had been achieved within the Northern and Central Regions of Missouri, resulting in management techniques shifting toward the liberalization of hunting quotas in order to prevent overabundance. From there, deer management has become more involved as we work to fine-tune socially acceptable deer populations throughout the state.

To address this overarching objective, deer management in Missouri is focused on establishing and achieving population goals on a more localized level. Regulations and management decisions are considered on a county-by-county basis, which requires an intimate understanding of localized deer populations, as well as stakeholder concerns and opinions.

In order to be successful, we have taken steps to better understand the movement and home ranges of deer across the landscape, patterns of deer mortality and reproduction ([see page 29](#)), and changes in hunter participation. We are also addressing new challenges by gathering age-at-harvest data through Telecheck measurements and tooth samples ([see page 25](#)). By having a better idea of the age at which deer are harvested, we can apply this information to accurately model population growth at the county level.

In order to address changes in Missouri's hunter population and participation rates, MDC periodically employs new regulations as well as outreach and education tactics that facilitate hunter recruitment and retention. The legalization of crossbows during archery season and hunting clinics designed for beginning hunters are examples of a recent changes made by the Department in response to changes in hunter participation.

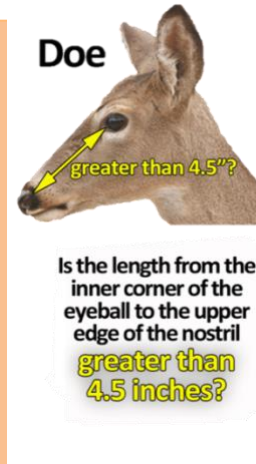
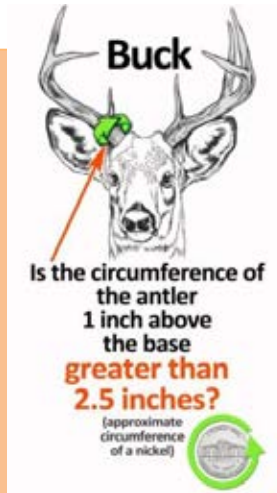
Managing wildlife populations for the enjoyment of Missourians may not always be easy, but the Missouri Department of Conservation is up to the task. The MDC will continue to embrace new challenges by employing advances in technology in order to gain further insight and will work with Missourians to ensure our deer and elk populations remain balanced and healthy.



Agricultural producer opinions about MDC's management of deer in Missouri, 2016. Survey results are one of many useful tools we use for regulation and management planning.

Telecheck

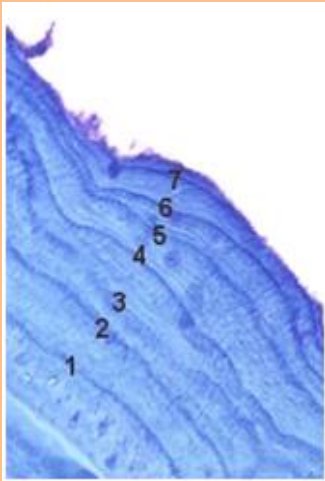
Telecheck is a powerful monitoring and management tool utilized by Cervid Program staff. Not only is it a record of the number of harvested deer, but it also has the potential to provide the composition of the harvest—the number of fawns, yearlings, and adult bucks and does that are harvested each year. Having this information is beneficial for tracking population growth at regional and county levels and can be used to inform management decisions such as bag limits and season lengths.



Hunters are asked to take a measurement from their harvested deer and answer a question in Telecheck. The purpose of these measurements is to determine the age of the deer that was harvested. The question about does helps differentiate between female fawns (0.5-year-old) and older females, and the question about bucks helps differentiate between yearling (1.5 years old) males and older bucks.

Age at Harvest Sampling

In addition to the Telecheck measurement questions, we are also working with universities and meat processors throughout the state to collect teeth from harvested, adult deer. These tooth samples are then sent to a lab to have the layers of cementum annuli analyzed. Much like growth rings in a tree, these layers develop on the tooth root over time, enabling us to more precisely age adult deer.



The layers cementum deposited on the root of teeth.



The front two incisors are collected for aging.



An image of an extracted incisor from an adult deer.

All About Crossbows

The 2017 Archery Deer Season marked the second year of crossbows as a legal archery weapon for deer and turkey. We changed the regulation to allow crossbows during archery season in order to increase archery hunter recruitment, retention, and reactivation. We reported last year that archery deer harvest was largely unaffected by the regulation change, while we did see an increase the number of permitted archery hunters. We also saw that successful archery hunters were more likely to use crossbows to harvest their deer if they were less than 10 years of age or older than 50 years of age.

For the 2017 archery deer season, we recorded the highest archery deer harvest ever of 51,991 deer, which was 9% higher than last year and 10% higher than the 10-year average. Was this record deer harvest due to crossbow hunters? Although this was a record year for archery deer harvest, archery deer harvest did not constitute a higher proportion of the overall deer harvest than it has in the past (Table 7). Harvest numbers were up across almost all seasons and portions this year and firearms deer harvest continues to drive fluctuations in the total deer harvest (**Figure 8**).

We recorded an increase in the number of successful hunters that used a crossbow in 2017 (38%) compared to 2016 (30%). This means that more archers are opting to take their deer with crossbows than with other archery equipment. Based on what other states that have allowed crossbows during archery season have reported, we can expect this percentage to continue to increase. Archery any-deer permittees increased from a mean of 107,794 from 2011-2015 to 115,575 in 2016 and 115,101 in 2017. Youth archery permittees increased from a mean of 6,607 during 2010-2015 to 7,455 in 2016 and 8,346 in 2017. We have also seen an increase in the number of “new” archery hunters (**Figure 9**). The increase in youth participation and recruitment of new hunters were primary objectives of the change to allow crossbows during archery season.

During the 2016 Archery Deer Hunter Survey, we asked archery hunters which weapon they used to hunt, if they successfully harvested a deer, and if they shot and failed to recover a deer. We used this data to determine if there were any differences in success rates or wounding rates among archery weapon types. The 2016 Archery Deer Hunter Survey results showed no significant difference in success or wounding rates among compound bow, crossbow, or primitive (atlatl and longbow) bow hunters (**Figure 10**). We will use the Archery Deer Hunter Survey to continue to monitor trends in weapon use among hunters as well as success and wounding rates by weapon type.

Table 7. The proportion of total deer harvest by sex and age class of deer harvested during archery season. The regulation change allowing crossbows was instated in 2016.

Year	Antlered bucks	Button bucks	Does	Total
2017	0.16	0.18	0.22	0.18
2016	0.16	0.17	0.20	0.18
2015	0.16	0.17	0.20	0.18
2014	0.18	0.17	0.20	0.19
2013	0.19	0.18	0.21	0.20
2012	0.15	0.15	0.19	0.17
2011	0.16	0.15	0.19	0.17
2010	0.15	0.13	0.16	0.16

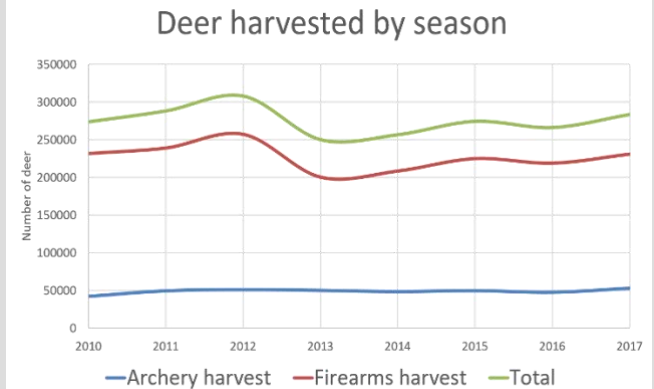


Figure 8. Deer harvested by season type 2011-2017.

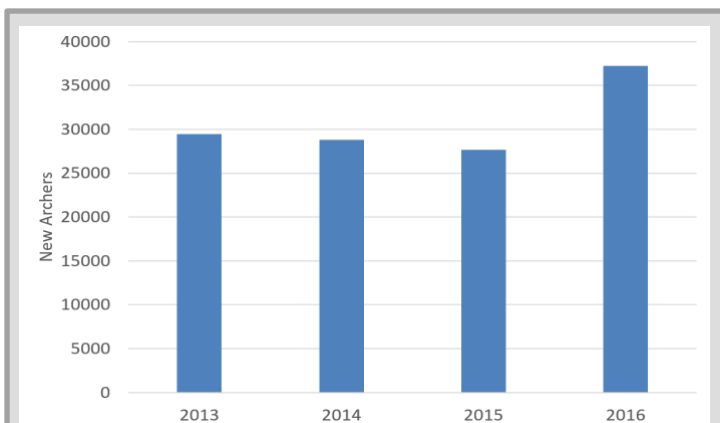


Figure 9. Number of archery deer permit holders that had not previously purchased an archery deer permit, 2013-2016.

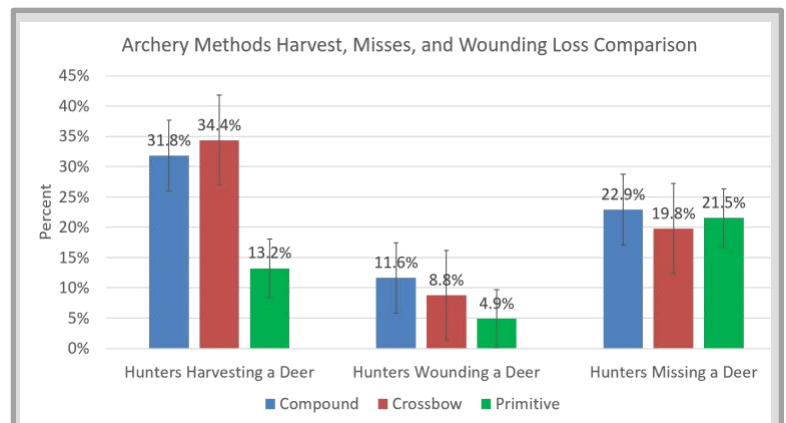


Figure 10. Harvest success and wounding rates by archery weapon type estimated from responses to the 2016 Archery Deer Hunter Survey.

Season Timing, Hunter Opinions, and Deer Herd Health

Deer hunters are often curious about how deer seasons are set. Setting deer season dates and limits involves finding a balance between changing hunter opinions and values, and the health and well-being of the deer population. The most recent changes made to the Missouri deer season dates occurred in 2016, which were a result of the revision of the Missouri White-Tailed Deer Management Plan in 2014. During the revision process, public input was sought regarding potential changes to deer season timing and length. Potential changes considered during this process included moving the November portion of the Firearms Deer Season later in the year, reducing the length of the November Portion of the Firearms Deer Season from 11 to 9 days, and moving the Antlerless Portion of the Firearms Deer Season to October, among other topics. Public input on these topics was sought through public meetings, online comments on the Management Plan, and via phone calls and emails from the public to Deer Program staff. We also use our Missouri Deer Hunter Opinion Survey, which is conducted every few years, to ask questions about potential changes to deer regulations. Overall, we found little hunter support for moving the November Portion later in the season and moving the Antlerless Portion to October. We've also seen decreasing support for moving the November Portion later in the year via our Hunter Opinion Surveys (**Figure 11**). Of course, we have to consider the health of the deer population as a major consideration regarding season timing. The current timing of the November Portion, coinciding

with the height of the rut, may negatively impact deer breeding if not enough bucks survive to breed females.

We are able to monitor the breeding success of the deer population during CWD winter operations (**Figure 12**) and the Deer Survival and Recruitment Research Project (see **Page 29**). With both of these monitoring programs we determine the proportion of age classes of does that are bred each year and the timing of that breeding. We've found that despite the timing of the November Portion, does appear to be bred at high rates (91-95% of adult does are bred each year) and during the height of the rut (**Table 8**). This does not mean there would not still be benefits to the deer population if we moved the November Portion later. A later timing for this season would likely positively influence buck age structure. However, given the importance of the current season timing to Missouri's deer hunters, and apparent high breeding success of the deer population despite the current timing, changing the season dates at this time does not appear warranted. Deer hunter opinions are fluid and dynamic, and we expect that opinions regarding the timing of the November Portion may very well shift in the future. We will continue to monitor both the opinions and values of the hunting population and the health and stability of the deer population to determine if changes in season timing or other deer regulations are appropriate.

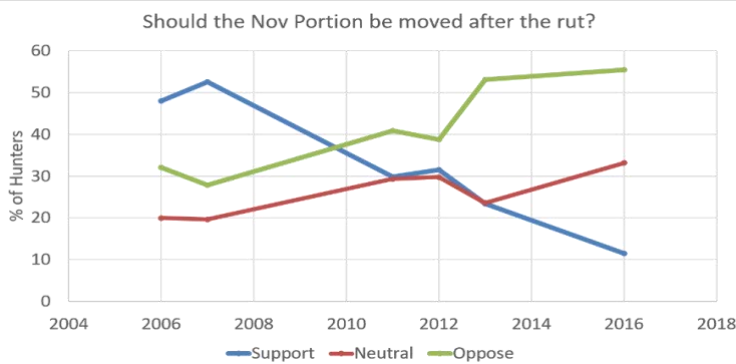


Figure 11. Trends in hunter opinions about moving the November Portion of the Firearms Deer Season later in the year from the Hunter Opinion

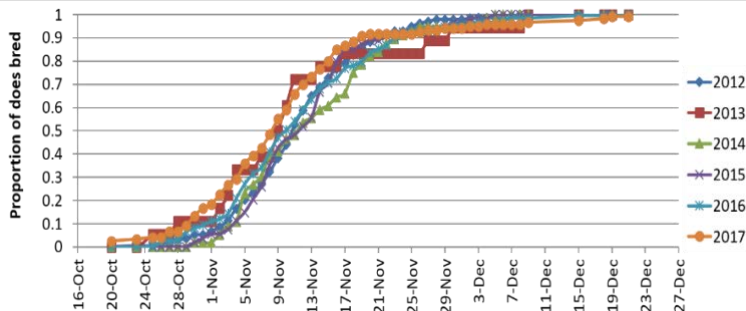


Figure 12. Proportion of pregnant does bred by date in Northern Missouri, 2012-2017. Data collected from does culled during CWD operations.

Portion	Current Formula for Season Timing
Early Youth	Weekend 12 days prior to Nov. portion
Nov. Portion	11 days, ends on Tuesday prior to Thanksgiving
Late Youth	Weekend (including Friday) after Nov. portion
Antlerless	Weekend (including Friday) after late youth
Alternative Methods	11 days, 19 days after antlerless

Table 8. Pregnancy rates and number of fetuses observed per adult female during CWD winter operations in each region.

Region	Pregnancy Rate Adult Females	Fetuses per Pregnant Female
North	0.91	1.97
Central	0.93	1.97
East	0.95	1.86

Deer Management on Private Land – Observational Data

Most deer management programs are based around simple objectives, such as increasing or decreasing deer density, balancing the sex ratio, or increasing buck age structure. Efficiently meeting these objectives requires some knowledge of the deer population prior to management and monitoring to track the progress of management actions over time through data. By far, the simplest and cheapest method of data collection is through visual observations. Recording some basic information after each time spent in the field, such as number and type of deer seen and number of hours in the field, can provide valuable information on the composition of the deer herd. All that is needed is a pencil, paper, and binoculars.

When collected and analyzed appropriately, observational data can help determine several important deer population characteristics that can then be used to guide management decisions: relative deer abundance, fawn recruitment, buck age structure, and sex ratio.

Methods for Collecting Observational Data

Consistency is extremely important when collecting observational data. To allow for among-year comparisons, data must be collected in the same manner and during the same time period each year. The optimal time to collect observation data is from August to October. By August, fawns are old enough to be highly mobile and can be readily observed. Additionally, antler growth in bucks will be far enough along to easily distinguish males from females. Observational data collection should be concluded prior to November when most of the harvest occurs, resulting in a change in herd composition.

Count every deer during each outing, even if a particular deer was seen during a previous trip. Deer frequent the same areas and may be counted multiple times, which is fine. The purpose is not to count every deer on the property a single time, but to determine the relative abundance of deer and proportion of bucks, does, and fawns in the herd. Record the date, whether observations were made in the morning or afternoon, total hours afield, location of observations, and the number of each type of deer seen (**Figure 13**). Unless a deer can be positively identified as a buck, doe, or fawn, record it as unknown.

Date	AM/PM	Total hours	Property/Area/Stand	Does	Fawns	Bucks	Unknown

Figure 13. Sample data sheet for recording observational data.

Calculating Population Indices

Once you have finished collecting observational data for the year, sum the columns to get a total number of hours afield, and total number of does, fawns, and bucks. Also calculate the total number of deer seen, including “unknown” individuals. From these numbers, simple calculations can be performed to determine population indices of interest. For example, relative abundance can be calculated as $(\text{Total Deer} \div \text{Total Hours})$ to get a deer/hour metric that can be compared across years. Similarly, fawn recruitment can be calculated as $(\text{Total Fawns} \div \text{Total Does})$ to get a fawn/doe metric. Healthy deer populations have a fawn/doe ratio of approximately 0.8 or higher. Adult sex ratio can be calculated as $(\text{Total Does} \div \text{Total Bucks})$. A doe/buck ratio of 3 to 1 or lower is desirable. With additional training in Aging-on-the-Hoof techniques, buck age structure can also be determined through observational data. For more information on this technique and for additional deer-management resources, visit <https://extension2.missouri.edu/publications> and search “deer.”

Cervid Program Research Projects

Survival, Recruitment, and Movement of White-tailed Deer in Missouri

This study, now in its 4th of 5 years, is designed to evaluate deer reproduction, movement, and survival patterns in 2 contrasting Missouri landscapes: the glaciated plains of the north and the forested hills of the central Ozarks. Chloe Wright has been a part of the deer research project as a Master's student since it began in 2015. The focus of her research has covered a variety of topics including the effect of various habitat characteristics on neonate survival; female deer behavior during pregnancy, parturition, and lactation periods; and behavioral responses of female deer to hunting pressure. Chloe concluded her thesis during the Spring 2018 semester. While many valuable findings have come from the work done by Chloe, we will focus in this report on her first chapter, which delves into the effect of various habitat characteristics on neonate survival in the Glaciated Plains and Ozarks of Missouri.

Pregnant females (n=111) were fitted with GPS collars, which were used to create weekly home ranges. Various habitat metrics were measured within each home range and examined for any effect on the survival of 226 neonates (fawns).

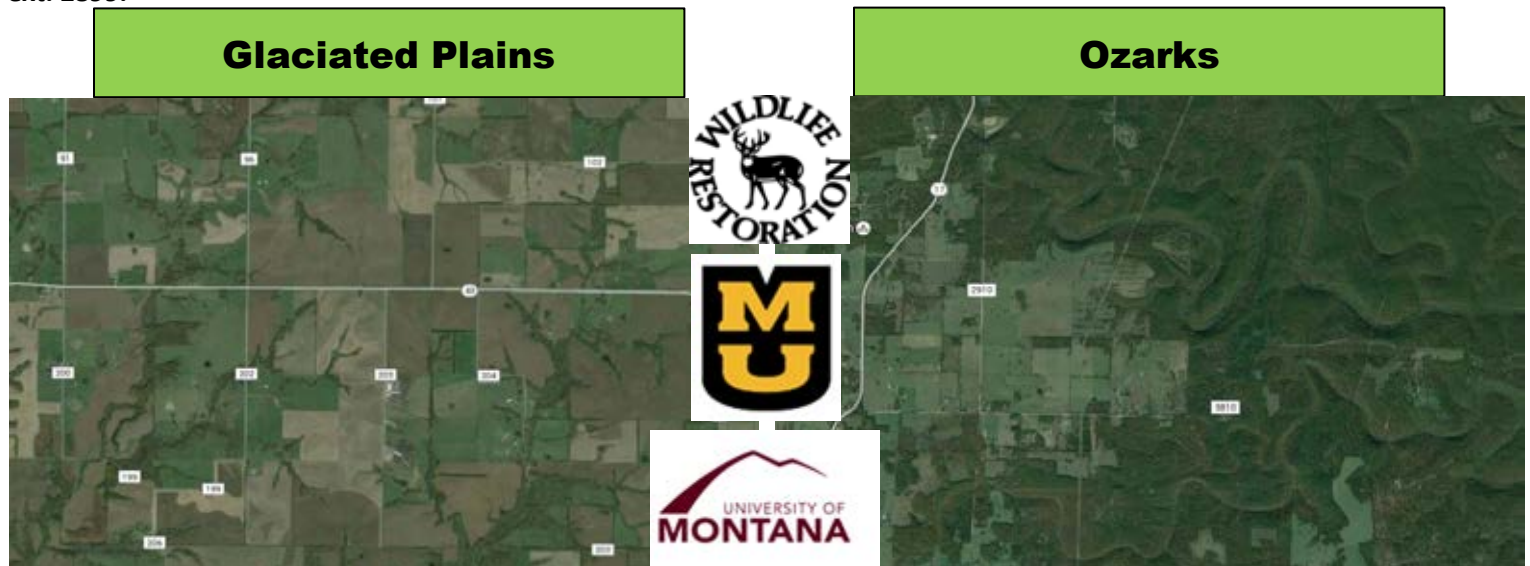
Not surprisingly, different habitat characteristics were important to fawn survival in each study location. In the Glaciated Plains of northern Missouri, fawn mortality increased with increasing edge habitat. Chloe theorized this could be attributed to increased searching efficiency of predators along hard edges. Fawn survival may be improved by managing for larger (>14 ha), contiguous patches of habitat, reducing the amount of edge, or maintaining edges as gradual transitions between habitat types, rather than hard edges with stark contrast between habitats. Creating "soft" habitat edges through techniques such as edge feathering will promote a diversity of high-quality forage for dams, while also increasing fawn survival.

In the Ozarks of southern Missouri, fawn mortality increased with increasing grassland patch density. The Ozarks is largely dominated by contiguous forest patches. Smaller, fragmented patches of grassland might have been easier for predators to thoroughly search. Thus, predators may key in on those patches, increasing fawn mortality. Managing for larger, contiguous patches of grassland may decrease predator efficiency and increase fawn survival in the Ozarks.

In both locations, fawn mortality was most sensitive to habitat characteristics until 2 weeks of age, after which fawn survival began to stabilize.

Chloe's thesis can be found in its entirety at <https://scholarworks.umt.edu/etd/11135/>.

For questions or if interested in participating in the study, contact the Private Lands Deer Biologist at (573) 815-7901 ext. 2899.



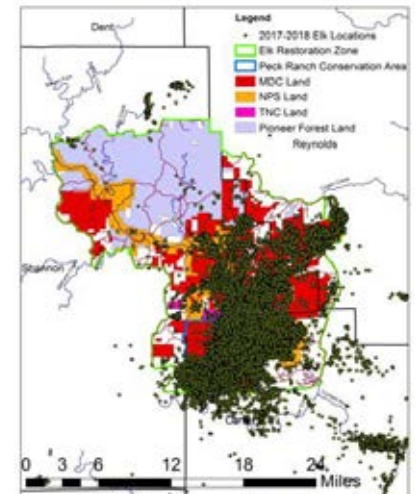
Restoring Elk in Missouri

Year	Bulls	Cows	Pregnancy Rate	Sample size
			Adult / Yearling	Adult /
2015/2016	18	38	100% / 100%	28 / 6
2016/2017	17	38	91% / 75%	32 / 4
2017/2018	12	58	78% / 36%	45 / 11

Year	Calves	Collared	Survival
2015/2016	40	21	62%
2016/2017	53	32	72%
2017/2018	35*	30*	83%*



*As of July 15, 2018



Elk GPS locations from June 2017-May 2018.

Elk, a native species in Missouri, disappeared from the state during the mid-1800s primarily due to unregulated hunting. Elk were reintroduced into Missouri between 2011 and 2013. Free-ranging elk from Kentucky were captured, underwent rigorous health testing, and were then transported to South-central Missouri (Carter, Reynolds, and Shannon counties) for release. This area was chosen for elk restoration due to the high amount of public land, low road density, and low row-crop acreage. The target population is around 400-500 individuals and plans are to manage the herd through regulated hunting in the coming years as the population grows.

The elk spend the majority of their time within the Elk Restoration Zone (see above right), usually on a combination of MDC, National Park Service, and Nature Conservancy lands. Support for the elk remains high and the public enjoys the presence of this native herbivore on the landscape.

Researchers with MDC, the University of Missouri, and the University of Montana have been busy monitoring the elk. Crews have captured elk throughout the last 3 winters to assess their health and to equip them with GPS collars. Capture of these individuals is part of regular monitoring efforts to help better understand how elk are utilizing their habitat, to monitor survival, and to check for pregnancy among cows.

Any pregnant cows that are captured are given a vaginal implant transmitter (VIT). Those VITs will allow researchers to detect when the cows give birth later this spring, find the newborn calves, assess their health, and fit the calves with a collar to monitor their survival. The same efforts last year aided in the capture and collaring of 32 newborn calves.

As of July 1, 2018, 88 adult elk are collared (24 male, 64 female). The information collected from these collars will help researchers develop a model to better track population growth and make sound management decisions. The population is estimated to be around 170 individuals including 50 adult bulls, 20 yearling bulls, 80 cows, and 20 yearling cows. The population is showing signs of increased calf production. As a result of the increasing number of elk, an annual growth rate exceeding 10%, and the high bull:cow ratio, the Department is beginning the regulation process to plan for an elk hunt sometime in the next few years. Assuming the previously mentioned biological metrics continue their current trend, the first elk hunt in Missouri could be as soon as 2020. The next couple of years will be exciting for elk in Missouri!

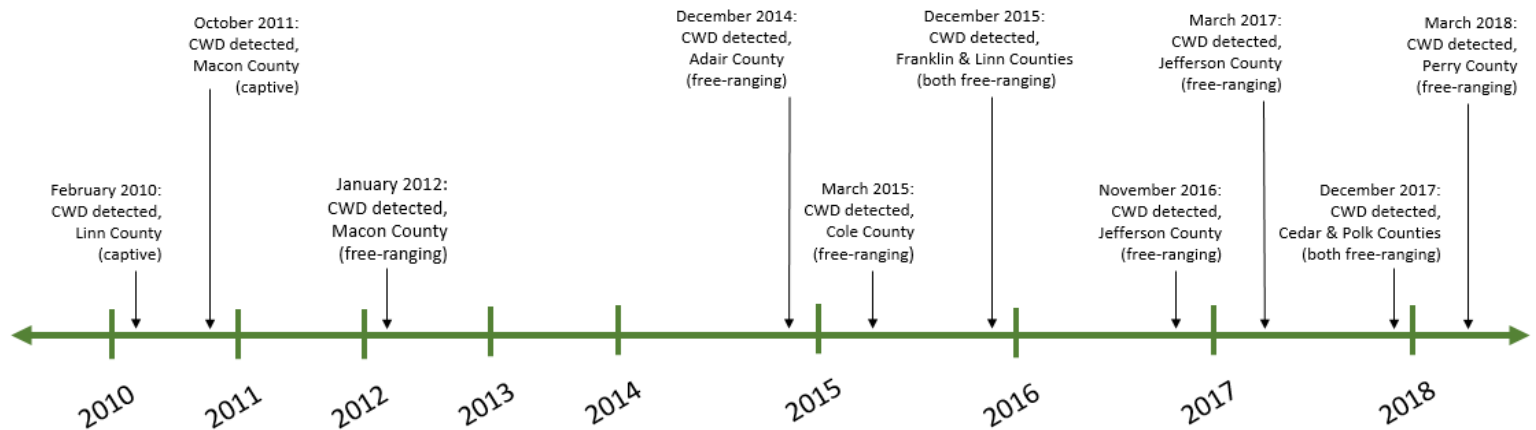
For more information, visit mdc.mo.gov or contact the Cervid Biologist at (573) 815-7901 ext. 2892.



Chronic Wasting Disease

CWD in Missouri

CWD has been found in eleven Missouri counties since 2010. As of October, 2018, CWD has been detected in 75 free-ranging deer in Macon (26), Adair (13), Cole (1), Franklin (8), Linn (8), Jefferson (2), St. Clair (6), Polk (3), Cedar (1), Ste. Genevieve (6) and Perry (1) Counties, and 11 captive deer in Linn (1) and Macon (10) Counties.

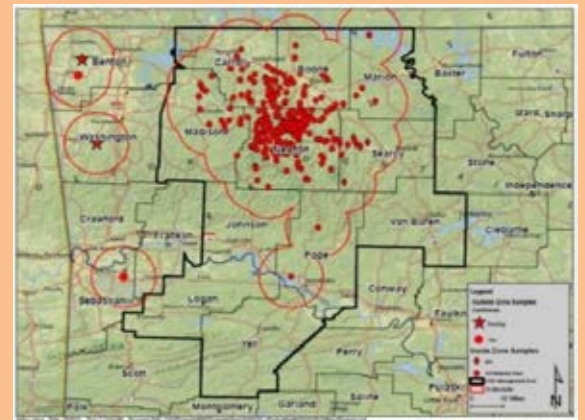


CWD in Arkansas

CWD was first detected in Arkansas in February 2015. As of October 9, 2018, Arkansas had detected 369 CWD-positive cervids in the state including 14 elk and 355 white-tailed deer. Given the wide distribution and relatively high prevalence of CWD in northwest Arkansas, Arkansas Game & Fish Commission officials believe the disease has been established for some time and is not a new introduction to the state. MDC immediately responded to the detection of CWD in northwest Arkansas by increasing surveillance in key southwest counties for the 2016-2017 season. In 2017, MDC added Missouri counties within 25 miles of Arkansas-CWD detections to the CWD Management Zone and further intensified surveillance by implementing mandatory CWD sampling opening weekend of fall firearms season within these counties. To date, Missouri has not detected CWD along the Arkansas border. Intensified surveillance will continue in this region.

CWD in Iowa

CWD was detected in Iowa's wild deer herd in 2013 and has been restricted primarily to the Northeastern portion of the state. In December 2017, a hunter-harvested adult doe in southeastern Wayne County within 5 miles of the Missouri border just north of Mercer County tested CWD positive. This is the first hunter-harvested deer in Iowa detected outside of the Northeastern region of the state. Given the proximity of this detection to the Missouri border, Mercer County will be included in the designated CWD management zone and added to the list of counties requiring mandatory testing during the first weekend of the 2018 November firearms season.



Arkansas' first CWD detection was an elk harvested during the 2015 hunting season. According to the Arkansas Game and Fish Commission, they have tested over 10,000 deer and elk and have discovered prevalence rates of 23% in white-tailed deer in Northern Newton County.



Deer suspected to have Chronic Wasting Disease.
Photo courtesy of Michael Way

Mandatory Sampling

During opening weekend of the November Portion of the 2017 Firearms Deer Season, hunters within 25 of the 41 County CWD Management Zone were required to present their deer to an MDC CWD sampling station. From the 16,000 samples collected, 12 adult males and two adult female deer were confirmed CWD-positive. Nineteen additional deer tested CWD-positive during the 2017-2018 season, including 2 hunter-harvested deer sampled by taxidermists, one road-killed deer, and 16 deer removed the close of the regular hunting seasons (January 15th) during post-season targeted culling efforts. Mandatory sampling provides valuable information regarding the distribution and prevalence of CWD on the Missouri landscape. For Fall 2018, the CWD Management Zone will expand from 41 to 48 counties. During the opening weekend of the November portion of the firearms deer season, hunters in all of the 31 Mandatory Sampling Counties will be required to present their deer, or deer head with 6" of attached neck at a sampling station, Nov. 10 and 11.

Managing CWD

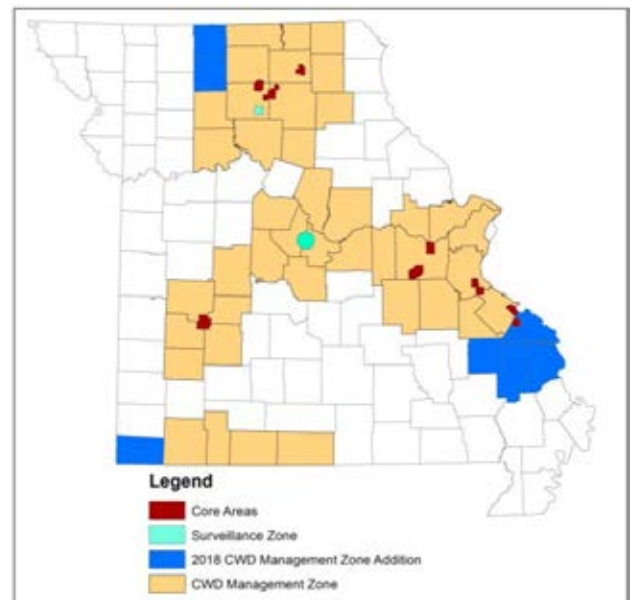
MDC has sampled over 101,000 deer throughout the state since 2001. Routine annual surveillance occurs in half of the state each year, with additional surveillance near CWD-positives. MDC establishes a "CWD Management Zone" around locations where CWD has been detected in Missouri. The CWD Management Zone includes designated counties within 25 miles of known locations of CWD-positive deer. Within the CWD Management Zone, MDC implements several regulation changes and management strategies to limit the spread and prevalence of the disease.

CWD Management Strategies

The following disease-management strategies apply within the CWD Management Zone:

- Moderately liberalize antlerless deer harvest during the firearms season to prevent unwanted population increases and limit the spread of the disease.
- Ban the placement of feed, minerals, and other consumable deer attractants because they unnaturally concentrate deer and can increase disease spread.
- Remove the antler-point restriction. Antler-point restrictions protect young bucks which are most likely to disperse to new areas and may spread the disease across the landscape.
- Intensify efforts to sample hunter-harvested deer in the CWD Management Zone.
- Implement post-season targeted culling within CWD Core Areas to decrease the spread and prevalence in localized areas where the disease is known to exist.

For more information regarding CWD or disease management, visit mdc.mo.gov or contact the Wildlife Disease Coordinator at 573-815-7901 ext. 2934.





DEER CARCASSES CAN SPREAD CWD

CARCASS HANDLING TIPS FOR DEER HUNTERS



- 1) **Dispose of parts in a permitted landfill.** CWD is unlikely to migrate out of a permitted landfill and infect other deer. Take your carcass parts directly to a permitted landfill or use your regular trash collection service.
- 2) **Bury on site.** CWD in soil can remain infectious for years, but placing a barrier between the carcass and scavengers lowers the risks of spread.
- 3) **Leave in place.** If CWD is already on the property, it is better to leave it there than introduce it to a new area.
- 4) **Taxidermy & meat processing:** If utilizing a taxidermist or meat processor, choose a business that utilizes a permitted landfill for disposal.



- 1) **Do not dispose of in water:** Do not dispose carcasses in ponds, lakes, or waterways.
- 2) **Do not burn:** Burning at normal temperatures does not destroy CWD.
- 3) **Do not transport to another property:** If you move carcass parts from the property where harvested, dispose of in a permitted landfill. Bury only as a last resort; you will reduce but not eliminate the risk of spread.

SOME CARCASS PARTS ARE LOWER RISK:

- Meat that is cut and wrapped
- Meat that has been boned out
- Quarters with no part of the spinal column or head attached
- Tanned hides and finished taxidermy mounts
- Cleaned skulls, skull caps, and antlers with no tissue
- Capes
- Cleaned teeth

YOUR HEALTH: There have been no known cases of CWD in humans to date. The Centers for Disease Control and Prevention (CDC) recommends that hunters in areas with CWD take the following precautions:

- Strongly consider having your deer tested for CWD before you eat the meat.
- If your animal tests positive for CWD, do not eat meat from that animal.
- When field-dressing a deer:
 - o Wear latex or rubber gloves when dressing the animal or handling the meat.
 - o Minimize how much you handle the organs of the animal, particularly the brain or spinal cord tissues.
 - o Do not use household knives or other kitchen utensils for field dressing.
- Don't consume animals that look sick.
- If you have your deer or elk commercially processed, consider asking that your animal be processed individually to avoid mixing meat from multiple animals.

FOR MORE INFORMATION ON CWD, PLEASE VISIT MDC.MO.GOV/CWD



Missouri Department of Conservation